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VETERINARY MEDICINE

APRIL 1936

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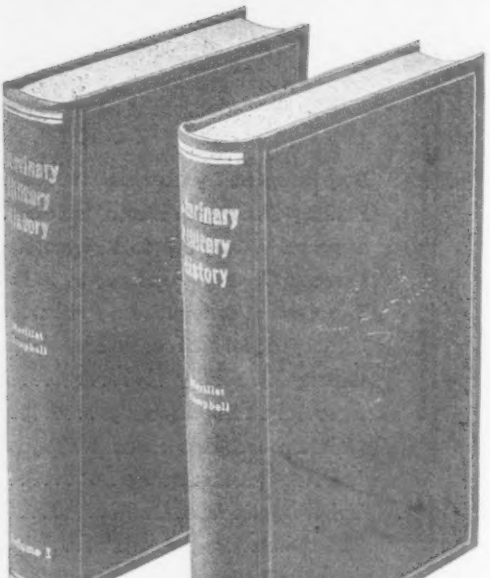
VETERINARY HISTORY

By Drs. L. A. Merillat and D. M. Campbell



It is astonishing how little many veterinarians know about their profession. Under the circumstances, it is perhaps not surprising that a large part of the general public is almost unaware of its existence. If the representative of a profession in a given community is uninformed as to the achievements or capacities of that profession, the community is not likely to rate it very highly, however much it may respect the individual. The veterinary profession has a long record of useful achievement. No nation has progressed far without domestic animals, nor maintained itself long if it neglected the health of its animals. Animal plagues of past ages have been precursors of famine, pestilence, war and overturned governments. Recurrent famines were the experience of all mankind until an efficient veterinary service was organized. Since that time, and only since that time, animal plagues have been controlled, a food supply made secure and rapid progress in civilization achieved.

There is no veterinarian, however local his interests, but can plan his program better and meet changing conditions more successfully if he knows the background of his profession, the development of veterinary service, its achievements and failures; for there have been many of both.

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D. M. Campbell, Editor **A. T. Kinsley, Associate Editor**
H. J. Mostyn, 1265 Broadway, New York, Eastern Representative

Blood platelets were discovered more than 50 years ago. The accepted theory has been that they are formed in the red bone marrow, but there was no proof of this. Recently, Howell of Johns Hopkins, has demonstrated that they are formed in the lungs. An important function of the platelets is to make the blood clot. This discovery gives a scientific explanation for the hemostatic action of crushed lung tissue.

Tamura and Boyd of the University of Cincinnati College of Medicine, believe that by killing disease germs with ketene, a chemical produced by decomposing acetone, instead of killing them by heat, that vaccines can be made for a number of diseases for which successful vaccines could not heretofore be prepared. The investigations of the Cincinnati scientists were carried out with *B. dysenteriae* in rabbits.

In New York State there are 60 veterinarians, employed by the big milk companies, who give their whole time, exclusively, to the examination of udders. This work has been made necessary to meet the milk inspection regulations of the New York City Board of Health. Any inspection to accomplish anything, must include three things: Regulations, inspection and supervision. None of the three can be dispensed with.

Liquid though it is, milk contains more solids by weight than oysters, tomatoes, asparagus, lettuce, or beets.

Taking large amounts of rickets-preventing vitamin D into the body causes no harm whatever, it is indicated in recent research by Dr. Harry Steenbock, the Wisconsin University scientist whose investigation led to irradiation of food products to increase their vitamin D content.

Members of the Chemistry Department of Fordham University have discovered an inexpensive process of extracting pure vitamin B from rice polishings, yeast and wheat germ. One and one-half tons of rice polishings are required to make one ounce of the anti-neuritic vitamin.

The value of vitamin D milk from the public health standpoint cannot be estimated definitely yet, because of the short time since its introduction and the small amount consumed. However, in Chicago during the past year the consumption of fluid and evaporated vitamin D milk has amounted to 16% of the total milk sales. During the same time severe rickets has disappeared and milder forms have declined noticeably in a group of preschool children examined regularly every year at child welfare stations.

A South African zoo has three baby lion-tigers, offspring of a lion sire and tiger dam.—*S. N. L.*, 27:734.

Poultry men are now told how to feed hens so as to produce lighter yellow or darker orange egg yolks—*S. N. L.*, 28:762.

Serum treatment has reduced deaths due to snake bite in the United States, from over 14 to less than 4%.—*S. N. L.*, 28:762.

Texas longhorn cattle, now rare, enjoy protection with big game animals on the Wichita game preserve in Oklahoma.—*S. N. L.*, 28:762.

COPPER AS IMPORTANT IN FOOD AS IRON

Deficiency of copper in the body may play as important a part in certain forms of anemia as does a deficiency of iron, Prof. C. A. Elvehjem of the University of Wisconsin has reported.

In explanation of this he reported that experiments during the past three years on anemic rats indicate that the administration of iron does not stimulate the maximum production of red blood cells unless traces of copper are added to the treatment.—*S. N. L.*, 38:757.

DOG HONORED BY MONUMENT

Honoring the dog, so often the hero and invaluable aid of medical research, a bronze monument will be erected on the grounds of the All-Union Institute of Experimental Medicine at Leningrad.

The Monument to the Dog, as it is to be called, will be erected at the suggestion of Academician I. Pavlov, whose famous discoveries in physiology were made by means of studies with dogs.

The monument is to be a bronze image of a sitting dog on a pedestal. Bas-reliefs on all four sides of the pedestal will depict separate moments from the life of the dog at Pavlov's laboratory.—*S. N. L.*, 38:752.

Veterinary medicine does not lend itself well to dramatization and consequently is not very good news. The work of the profession is not mentioned in the headlines of the daily papers and it would require a writer of unusual ability to develop the story of the accomplishments in the field of veterinary medicine as they concern humanity so that it would be generally read.—*C. H. Stange.*

There are 125,000,000 human beings and 650,000,000 domesticated animals and birds, not considering our wild life, living in the United States at the present time. It is perfectly obvious from our present knowledge of diseases of various kinds that there can be no satisfactory state of health among our human population when, and if, our live stock is suffering from intercommunicable diseases.—*C. H. Stange.*

FERTILITY-CAUSING VITAMIN ISOLATED AS AN ALCOHOL

Vitamin E, the fertility vitamin without which female animals cannot produce young, appears to be one of the higher alcohols.

At the meeting of the American Chemical Society, evidence to that effect was presented by Drs. H. M. Evans, O. H. Emerson and G. A. Emerson of the University of California.

They made a concentrated extract of the vitamin-containing substance from wheat germ, known to be rich in vitamin E, and then by suitable chemical manipulation produced a crystalline substance so potent that laboratory animals were relieved of their sterility by a single dose of three milligrams —a less-than-pinhead sized bit.

Analysis of the substance showed it to be quite a complex higher alcohol, each molecule containing 29 atoms of carbon, 50 atoms of hydrogen and two of oxygen. Ordinary ethyl or grain alcohol has a much smaller molecule, consisting of 2 atoms of carbon, 6 of hydrogen and 1 of oxygen. —*S. N. L.*, 38:751.

All applicants for a marriage license in the State of Connecticut must pass a Wasserman or Kahn test before a license will be granted. The certificate must be based on a blood examination by an approved laboratory. Other states requiring medical examination upon the issuance of a marriage license are Wisconsin, Oregon, North Dakota, Alabama, Wyoming and Louisiana.

Eclampsia, convulsions and coma, characteristic of toxemias, but due to a lack of protein, are responsible for one-fourth of all maternal mortality, according to Straus of the Boston City Hospital. "If the expectant mother does not eat enough protein food—meat, fish, eggs and milk—instead of losing weight, she gains weight excessively. In many cases, this condition leads to convulsions, which frequently result in death of both mother and child."

A survey of Brunswick County, Virginia, by the United States Public Health Service, showed that of 42 licensed midwives in the county, 40 are colored, two white. Over half of them can neither read or write and only 11 said they had gone through the fourth grade at school. Their ages range from 38 to 88 years; 25% being over 70. They reported nearly 75% of the births in Brunswick County; physicians, friends and neighbors, the remainder.

In 1910, Dr. G. W. McCoy of the U. S. Public Health Service, while hunting for plague infected ground squirrels in the vicinity of Tulare Lake, California, isolated a bacterium from necrotic foci in the livers of the animals that he called *B. Tularense*. In 1919, Dr. Edward Francis investigating deerfly fever in Utah, isolated the same organism from the blood of a victim and the disease became known as tularemia and recognized as being the same as rabbit fever, which occurred rather commonly in hunters and was also responsible for epizootics among rabbits. Since then, tularemia has been recognized in many other wild animals, including birds, and in sheep.

There are three types of vitamin D milk on the market: metabolized vitamin D milk, containing 430; fortified vitamin D milk, containing 400; and irradiated vitamin D milk containing 135 U. S. P. units of vitamin D per quart.

Stomach ulcer is only a symptom of a more general abnormal condition, according to Dr. Alton Ochsner, professor of surgery at Tulane University School of Medicine. Persons subject to ulcers must change their habits of living for the course of their lifetime, the Tulane investigators advise, pointing out that while surgical treatment may be of value in some complications resulting from ulcer, it will not change the nature of an individual predisposed to ulcer.

SURGEON WARNS AGAINST HOME REMEDIES FOR BURNS

Warning against old-fashioned home remedies for burns, such as smearing the burn with butter, grease, ointment, oils or even that old stand-by, Carron oil, was issued by Dr A. B. Bettman of the University of Oregon Medical School at a meeting of the American College of Surgeons.

Such remedies may make serious burns more serious. In minor burns such treatment may do no harm, but as Dr. Bettman put it, "it is a case of the burn getting better in spite of the treatment."

"At the present time," he said, "physicians have learned that the best treatment for a serious burn is to give the patient a narcotic, remove the burned tissue, and apply, first a 5% solution of tannic acid, and then, immediately, a 10% solution of silver nitrate. This forms, almost instantly, a black, leather-like, antiseptic, protective dressing. This is dried quickly and kept dry. No other dressing is applied."

After the actual burns are dressed there must be a comprehensive program of treatment for the patient. — *Science News Letter.*

DISEASE CONTROL MEASURES IN 1500 B.C.

While all the rest of the world regarded disease as a visitation or supernatural punishment, Moses recognized that some diseases were communicable and might be prevented by forethought and care. All his public health measures were based upon this concept. Thus, for the leper: "All the days wherein the plague is in him he shall be unclean . . . he shall dwell alone; without the camp shall his dwelling be." If the priest were not certain the disease was leprosy, the suspect was shut up seven days and reëxamined. When the priest was satisfied the sick was healed, ceremonies of purification were in order, a part of which was "And he that is to be cleansed shall wash his clothes and shave off all his hair and bathe himself in water, and he shall be clean." Only then could he mingle with his fellows.

Moses also recognized the danger of the spread of disease from contact with the dead or their surroundings. "He that toucheth the dead body of any man shall be unclean seven days," and "When a man dieth in a tent, everyone that cometh into the tent shall be unclean for seven days." During these periods, they were required to live alone and outside the camp. At the end of the seven-day periods of quarantine, the priest made an inspection and if satisfied the suspect was not diseased, "he shall wash his clothes and be clean." The presence of a communicable disease in a community was required to be announced by a warning blast of the *shofar*. The priests and the Levites were the health officers and Moses commanded "Take heed that thou observe diligently and do accordingly all that the priests and the Levites shall teach you. As I command them so shall ye do."

The remarkable meat inspection regulations of Moses are well known to veterinarians. That he possessed knowledge of veterinary medicine, other than that required for the protection of the public health, is shown by the effective measures he adopted when a plague of anthrax invaded the herds in the valley of the Nile. By the simple experiment of driving the cattle of the Israelites out of the low lands and onto the comparatively barren hills at the first alarm, they were saved while the herds of the Egyptians remaining along the streams succumbed. Whether Moses knew the menace of anthrax in overflowed lands and whether he knew the disease is transmitted to herbivorous animals largely by biting flies and that such flies harbored in the tall vegetation along streams, is speculative, but the fact remains his measures for the control of this disease are good practice today after a lapse of 3,500 years, and effective now as then.

* * * *

THE COST OF SAFEGUARDING MILK

The cost to the public in a municipality of providing reasonably adequate sanitary supervision over milk supplies is about 8 cents per capita per year. This cost amounts to a little less than one-half cent per gallon of milk consumed. It amounts to about $47 per year for each producer or plant. These average costs vary considerably with the size of municipalities, the unit cost usually being less for the larger cities and more for the smaller ones. The highest per capita costs, for example, are about 20 cents and the lowest 2 cents annually. The per gallon cost varies from a little more than one-half to about two-tenths of a cent.

The foregoing is based upon a survey by the U. S. Public Health Service and refers to the operation of the Health Service "Standard Milk Ordinance" which can hardly be said to provide a "reasonably adequate" sanitary supervision over milk supplies. About the best that can be said for the "Standard Milk Ordinance" is that its adoption brings about a marked improvement in the market milk in backward communities which cannot be induced to adopt a more adequate control measure. It is believed, however, that the cost of really good milk control measures is not materially higher than the cost of the "Standard Milk Ordinance."

COUNTY AGENTS EXCEL IN PROPAGANDA

The first county agent was employed in Smith County, Texas, in 1906. By 1911, numerous counties all over the Corn Belt had county agents. In 1913, the Smith-Lever Act provided funds for State Agricultural Colleges to set up county organizations through which the county agents, renamed farm advisers, could work. The Federal government paid a part of their salaries. From these county organizations, the Farm Bureau developed. At the outbreak of the World War, with funds from the Emergency Food Production Act, the county agents demonstrated themselves to be the most powerful of agencies for propaganda. Their number grew from 542 on July 1, 1917, to 1133 on July 1, 1918, and has doubled again since. In 1919 they organized the National Farm Bureau Federation and when the post-war tumble in the prices of farm products began in 1920, they went into politics in a big way. Federal appropriations for their division of the Department of Agriculture, Agricultural Extension, were pyramided to reach 10 million dollars annually and a separate building containing five miles of corridors was erected to house the division. They forced through the Congress the economic fallacy known as the McNary-Haugen Bill for agricultural relief, which was defeated by a presidential veto. The Smoot-Hawley tariff was their second attempt at farm relief, but it worked to the disadvantage of agriculture and was followed by the preposterous Farm Board of the Agricultural Marketing Act. Upon the inevitable failure of its third political panacea, the Farm Bureau Federation changed its political affiliations overnight and came forth with the unconstitutional AAA, in the maladministration of which positive genius was attained. It will be remembered for the slaughter of little pigs on the eve of a 30 per cent shortage in swine production; for aimlessly shipping "drouth" cattle from one barren section to another and ultimately sacrificing thousands to the screw worms; for restricting the production of wheat and corn to a point where large importations were required and other blunders, not for its potential good which was very great.

The American Farm Bureau Federation is the largest farm organization in the United States and unquestionably politically most powerful. It created and owned what was known as the "farm bloc" in the Congress. It marshalled the votes of Senators and Representatives belonging to that block as one disposes of lead soldiers on a chessboard. Its leaders have proved themselves adaptable to changing political conditions, but wholly incapable of putting their remedies into effect when granted everything asked in legislation funds and personnel.

The American Farm Bureau Federation consists of 35 state farm bureaus. It has a strong financial base in Federal money. Its local organizations are maintained by the county agents, paid out of Federal funds. Without this artificial support it would collapse immediately. For propaganda it is unequaled; for clear thinking or administration, its leaders have shown little inclination and less capacity.

* * * *

OFFICIAL QUACKERY

C. R. Underwood, Randolph County agent, is having a busy time in connection with the treatment of cattle for lung worms, hog cholera and infested flocks of poultry. —*Dominion News,* Morgantown, W. Va.

The county agent ran the mastitis test on the dairy herd of Ed. Glascock last week, but found no cows infected with the disease.—*The Perry Enterprise,* Perry, Mo.

A recent survey of the activities of county agents in Iowa, Nebraska and Kansas revealed 41% frankly engaged in veterinary practice as a part of their official duties; 23% who on their own statement attempted to diagnose and prescribe for the ailments of animals only on request and only 14% stated that they referred veterinary matters to local or other veterinarians.

ASSOCIATION MEMBERSHIP

THE strangest paradox of the veterinary profession of the United States is the accumulating fund of complaints registered against the *status quo* by members who contribute nothing, whatsoever, to the aggrandizement of organized veterinary medicine—the associations—the only conceivable instrument capable of improving matters.

The question: "What good does the state association do me," so often asked of the officers of such associations when they make membership drives among the delinquent, clarifies completely the etiology of the profession's infirmities; for, so long as there still exists, in considerable numbers, eligible veterinarians who have yet to comprehend that without the organizations, the occupation of which they complain would not even have a legal name, prospects are not bright. One should not begrudge paying a small annual fee to the daddy who created, baptized and maintains one's occupation, and, until the number of the begrudgers is materially reduced, the uplifting business will be a hard pull for the more far-sighted few who assume the responsibility of preventing complete dissolution of their profession.

"What good is the association," is not a very broad-minded question for anyone to ask, and it lays wide open the gross pathology of American veterinary medicine to which all remedies must first be directed. Whether the fault grew from delinquency of leadership or of membership does not matter. The result is the same and the cause must be corrected before the profession can hope to travel in the upward direction.

WHILE comparisons may be odious, they always have some value. The last (1935) report of the national veterinary association of France (*L'Association centrale des vétérinaire*) shows a membership of 3,468, and a revenue of 153,767.72 francs. Forty life memberships were taken out and 228 new members elected last year. Through the generosity of its members, the association received additional donations amounting to over 39,000 francs. Fifty-five widows or children of deceased members were assisted financially, various aged or sick members were pensioned or assisted, and 15 orphans are being supported from a special fund. The annual dues are 10 francs. At the last conference held at the school of Alfort, June 14-16, 1935, more than half the total membership was present and commercial exhibits made up a veritable scientific exposition comprising 81 separate booths, to which eleven pages of space is given in the official report. Needless to say, the program covered the important questions of the moment, technical and professional. The entire meeting shows throughout a spirit of close coöperation and undivided interest interspersed with banquets, entertainment and esthetic settings.

THE population of France is 37,000,000, that of the United States, 130,000,000, in round numbers. These figures and related facts not mentioning the enormous size of the American livestock industry, show the difference between the strength of coöperation expressed in terms of association membership and the impotence of individual brain storms.—L. A. M.

CALCIUM BORO-GLUCONATE SUCCESSFUL IN PREGNANCY DISEASE OF EWES

I have had a good deal to do with pregnancy disease of ewes and agree with the author of the paragraph on this subject in the January issue (page 5) regarding feeding and management. I cannot agree, however, with the statement that treatment is of little avail. Last spring, I treated about 50 with boro-calcium gluconate, (1 oz. calcium gluconate, 1½ dr. boracic and 6 oz. water), and the results were 100% successful. I inject the solution at the elbow and flank. The earlier treatment is commenced the better. Only one treatment is necessary if given in early stages of the disease.

JOHN P. MCLEOD.
Ashburton, New Zealand.

STARCH DIGESTION IN THE DOG[1]

Most dog owners and many veterinarians entertain the belief that dogs do not tolerate well a large proportion of starch in their diet.[1] This is not the case where the diet is properly balanced.

Rosebloom and Patton demonstrated conclusively a number of years ago, that the dog can digest starch raw or cooked. The work of the author has amply confirmed these findings. Except for the starch splitting enzyme in the saliva of man, the dog is as well equipped to digest starch as is man, and given the other necessary elements in his diet, the dog can digest starch efficiently up to 55 to 60% of his total ration.

The regular ration on which experimental dogs are maintained in the author's laboratory consists of 62% farina, 17% fat and 21% protein.

The explanation of the widespread impression that dogs do not tolerate a high percentage of starch in the diet must be looked for on some other basis than the inability of the dog to digest starch. It is common observation that dogs usually do poorly on such a diet, but this is due to some other factor than the excess of starch. No doubt it is due to a deficiency in other elements.

Vitamins, proteins and minerals are, of course, necessary in the diet of the dog. All of these are absent in starch, nor are they particularly plentiful in meat, the principal diet of the dog. As ordinarily fed largely on meat, dogs are always on the verge of vitamin deficiency. When a portion of this meat, which is low in vitamins, is supplanted by starch in which vitamins are entirely absent, a vitamin deficiency soon develops and this appears to be the logical explanation of the quite universal impression that dogs do not tolerate a high starch diet. It is not the starch that they do not tolerate, but the deficiency in vitamins and probably also certain minerals.

Malnutrition in such dogs, commonly attributed to an excess of starch in the diet, is in reality a low grade of avitaminosis.

The author finds an adequate ration for a 40-pound dog to consist of: 12 ounces hamburger steak with fat in it; 12 ounces of fresh, whole milk; 8 ounces of stale bread or farina; two drams cod liver oil.

The dog's tolerance for fat in the diet is somewhat lower than the tolerance of man; but by gradual increase, the fat in the diet can be worked up to 40% before digestive disturbances ensue.

[1] Notes from an address by A. C. Ivy, Ph.D., M.D., Dept. of Physiology and Pharmacology, Northwestern University Medical School, at the 54th Annual Meeting of the Illinois State Veterinary Medical Association, Chicago, Feb. 5-7, 1936.

* * * *

TUBERCULOSIS FROM CATTLE

Is control over bovine tuberculosis worth the cost? Since the beginning of the bovine tuberculosis eradication campaign in Illinois the mortality rate from tuberculosis among humans has declined about one-half, from approximately 100 to about 50 per 100,000 population. Some of that improvement is probably due to the control of bovine tuberculosis. How much is unknown.

More to the point is a recent report from Great Britain. A study of human pulmonary tuberculosis revealed that in three counties of Scotland, Aberdeen, Banff and Moray, 15, 18 and 25 per cent, respectively, of the cases investigated were of bovine origin. While it was not concluded from the 76 cases studied that a similar proportion of all pulmonary tuberculosis in these counties was of bovine origin, these findings were accepted as indicating that infected cattle are responsible for a significant amount of the human pulmonary tuberculosis. It was the opinion of the authors of the report, that milk from tuberculous cattle was the vehicle of transmission in most of the cases.

This situation in Scotland makes it appear that the eradication of bovine tuberculosis in Illinois has had an important influence over the decline of human tuberculosis in the small communities and rural areas of the State. Several rural counties had exceptionally low death rates last year from tuberculosis. Pasteurization protects most of the urban population of Illinois from milk borne diseases.—*Illinois Health Messenger.*

The "Bacteriologic Arm"

By L. A. MERILLAT,
Chicago, Illinois

SINCE the mythical past, nations at war have used the most deadly weapons the mind of man could invent. Spurts of inter-war morality have been no more effective in preventing the use of deadly methods of warfare than in preventing war itself. In 1907, the Hague Conference, for example, outlawed the use of lethal gas; yet, eight years later (1915) gas was used with deadly effect. Modern armies now delegate gassing to a special arm—chemical warfare—and gas is used by every police department. As if war had suddenly become a regulated sport, the world was terrified when the Germans first used gas in 1915. Even wise old generals, well-informed statesmen and professors of international law, who knew too well the moral aspect of war, pretended mankind had been outraged. Moral as the home folks may be when a nation's strength is mobilized for a conflict at arms, it is difficult to interdict any arm needed to prevent defeat or to bring home victory. War is violence, unchained. Politeness is not in the code of ethics. Victory at any cost, is the only slogan.

ANCIENT warriors threw pestiferous cadavers into camps of the enemy to spread plagues among them. In 1650, "substances capable of corrupting the atmosphere and occasion epidemics" were fired by artillery brigades (Marcenac, 1934). Smallpox was spread among the North American Indians at Arcadia in 1763 by sending them contaminated blankets (Nicolle, 1933). Anthrax and glanders cultures were sent to the Roumanians *via* the Bulgarian legation during the World War (Velu, 1935), and it has been hinted that outbreaks of foot-and-mouth disease in the United States were not just spontaneous infections. French official records as of June, 1917, March, 1917, and October, 1918, are said to prove the existence of a "bacteriologic arm" in the German wartime military organization. Professor Maslokowitch of the veterinary institute of Leningrad is charged with perfecting such a service in the present Russian army (Velu, 1935).

Opinions extracted from recent "peace conferences" and from individuals in high places, show that no weapon man can conceive is ever apt to be barred. As MacDonald declared: "As long as war is permitted, it will remain the strict duty of the belligerents to use all arms capable of achieving victory." From the research laboratory of the French Army comes the question: "La guerre microbienne est-elle realisable?", meaning: "Can microbian warfare be accomplished?" The question of right or wrong is outdated. The only perturbing factor is whether a "bacteriologic arm" can actually do a sufficient amount of killing—the cardinal object of warfare.

In a report to the League of Nations made in 1924, Pfeiffer, Bordett and Madsen, wrote: "The effect of a 'bacteriologic arm' can neither be measured nor localized. It could reach the civil population along the frontiers and start epidemics lasting long after hostilities had ceased." Canon, a co-reporter, said: "The 'bacteriologic arm' is full of unknowns in view of the possible development of the bacteriological science." He warns against sleeping on the job, unaware. Prof. Mayer (*Rec. de Méd. Vét.* Nov. 1935), cited by Velu, adds: "Were the agents used known, protective measures could be provided in time, but an army might find itself unprepared until considerable damage was done. While the handling of spontaneous epidemics is but a matter of routine, we know nothing of provoked epidemics."

HOW does all this affect our Veterinary Corps? A French military expert wrote recently to the effect that the Central Powers saw considerable hope in the inadequate veterinary services of the

French and English as they entered the World War. In this respect, the no-veterinary-service of the Americans must have been delightful when they came in in 1917. The Germans expected glanders and mange to incapacitate the transport service of the enemy and the French claim to have found well-placed cultures to accomplish that purpose. Mange did just that to the French and British at the beginning and was a complete success in the American forces to the end; taking the biggest cut among animals of the troops in action. Glanders and influenza incapacitated the animals of Service of Supply, the end result being an almost completely annihilated animal transport service as the Armistice approached.

THE potentiality of the mange mite and *B.mallei* is great, but it is subordinate to measures intelligently applied. Tetanus and anthrax are easy to prevent but foot-and-mouth disease, which takes its toll in empty stomachs and unshod feet, is difficult to handle. Rinderpest, contagious pleuropneumonia, equine encephalomyelitis, hog cholera, swine erysipelas have respective preventives provided a country is prepared to apply them. With an inadequate veterinary corps, untrained reserves, depleted veterinary personnel, and an extension service taking over responsibilities it is not qualified to compass, one guess is just as good as another as to the havoc a "bacteriologic arm" of a well-trained enemy could accomplish. It was a no less prominent figure than Frederick the Great who warned his people that: "To maintain an army one must occupy one's self with the stomach." So, all epizoötics are important in war, whether they concern transport or food. A recent Nazi decree states: "It is the obligation of horse breeders to consider it a duty to raise horses for the army." The horse associations of Germany committed to the enterprise have a membership of over 60,000. Italy is buying army animals in the United States. France, the Baltic states and Russia are nurturing horse breeding. So, in addition to food supply, a "bacteriologic arm" does materially concern the veterinary corps which, in war time, means the entire veterinary service of the country. It may be necessary not only to handle the "mine run" of animal diseases, but also group of man-made epizoötics superimposed, for, as sure as the sun sets every evening, and as sure as chemical toxicology has taken a place in the military service, just that sure will pathogenic microbiology take the form of a regulated arm in coming conflicts between nations. Not only the blind see naught.

* * * *

IMPROVED METHODS OF DISEASE CONTROL

It is difficult to realize today that during the last half of the nineteenth century widespread epidemics of such diseases as typhoid fever, diphtheria, smallpox, cholera, yellow fever, and, in the Orient, bubonic plague were still common occurrences, and that as late as the close of the century, with few exceptions, drastic and costly quarantines were about the only methods by which health authorities attempted to control the spread of disease, particularly of such diseases as plague, cholera and yellow fever, in both international and domestic commerce. In striking contrast, a resort to actual quarantine at the present time, such as the detention of vessels, passengers, and crews for a week or 10 days as was formerly not unusual, would be to confess that cooperative and, particularly, local efforts had somewhere broken down; that some nation or community had failed to discharge its obligation by allowing disease to get beyond control, thus becoming a menace to other nations or communities. I can remember when it was not unusual to hold a ship and its entire personnel in quarantine anywhere from 10 to 14 days. While always retaining the right to detain common carriers if this should become necessary, to be obliged to exercise this right today is to confess that some country has been, in a measure, derelict in its duty in not preventing such carrier from becoming infected.—Hugh S. Cummings, Surgeon General, U. S. Public Health Service; *Public Health Reports,* 50:35, pp. 1175-83.

Limiting Factors In Swine Production*

By A. T. KINSLEY,
Kansas City, Missouri

IT has been noted, for the last two or three years, at least in our section of the country, that swine were seldom mentioned at veterinary meetings. Swine were low priced; swine practice was at a low ebb, but just as soon as prices begin to adjust themselves, we find the veterinarians, as well as producers, interested in swine practice and swine diseases.

A few statistics will give a clearer understanding of the subject.

The swine industry is the cornerstone upon which has been builded the livestock industry and agriculture in the United States. During the last 36 years, there has been produced in this country approximately 2,100,000,000 swine with a value of $21,600,000,000. This is an average annual income to the American swine producer of 600 million dollars for the past 36 years.

The production of swine and their value has varied from year to year. Thus, in 1923, there were 69,304,000 swine produced with a value of $851,746,160; and in 1935, 37,007,000 swine were produced with a value of $236,000,000; 1935 being the low from 1930 to 1935, not only in the number of swine produced, but also in their total value. The lowest price per head was $4.14 in 1934 and the highest price per head was $23.28 in 1919. In 1919, the value of all the swine was one billion, 400 million dollars.

Price fluctuations from year to year plainly show that it is determined by supply and demand; organized pig killing and extensive drouth notwithstanding. It will have been noted that the low price for hogs (1934) was during the year following the purchase and destruction of six million pigs and 200,000 brood sows by the United States Department of Agriculture. The real reason for low price pork during that time was scarcity of money. There may have been demand, but there was not the wherewith with which to buy. The advance in price did not occur until the late fall of 1935, and a part of that increased price was due to the fact that more money was available with which to buy pork.

WHAT of the future? The complexity of national affairs is recognized. Up until now, it has been customary to judge the future by the past, on the theory that "History repeats itself." In the beginning, natural laws governed and drouths and pestilence, with rather frequent wars, balanced supply and demand of food products. An excess of people was corrected by war or pestilence. An excess of livestock was removed by pestilence or war.

What of today? War remains pretty much the same. The span of human life has been materially extended; animal plagues have been eliminated or brought under some measure of control. These questions arise: Is it beneficial to the human race for the medical profession to save the weaklings? Is the veterinarian actually rendering a service of value in saving animals less resistant to disease, or is he contributing to the production of a breed of weaklings?

Your own state (Indiana) had 2,357,000 swine, valued at $13,420,000 on January 1, 1935. The average annual swine production in Indiana is approximately three and a half million. In other words, on January 1, 1935, you had a 30% shortage in swine. However, the number of swine can be increased rapidly, providing the baby pig losses can be reduced. The saving of little pigs is an urgent duty just at the present time, because of the inadequate number of swine in your state and in the nation. It is a responsibility of the veterinary profession —in Indiana, your responsibility. The mortality of little pigs approximates the number of swine that is marketed each year. In other words, little pig mortality depletes the nation's swine herd by upwards of 40%

* Notes from an address at the annual meeting of the Indiana Veterinary Medical Association, Indianapolis, Jan. 21-23,1936.

each year. For one reason or another, almost half of the pigs that are farrowed in the community in which each of you lives die before they are 30 days old; notwithstanding your function and duty to prevent animal loss.

WHAT are the primary causes of pig losses? First, improper breeding. In our section, inbreeding is quite a problem. Because of our diminished breeding stock, this year every farmer is using every gilt that looks like it can be used for breeding, regardless of relationship to the herd boar. Another factor is pasture breeding, where the boar runs at large with the herd. Boars have been observed to make from 10 to 15 services a day in pasture breeding. A boar cannot make that many services a day and possibly produce a sizeable, healthy litter. It is impossible. Investigation has shown that the number of pigs produced by sows so bred usually average two or at the maximum three pigs per farrowing. The average litter of pigs not pasture bred varies between eight and twelve. Still another prolific cause of little pig mortality is breeding diseased sows. It needs no discussion here.

Another factor in the little pig losses is improper feeding. There was a time when most swine breeders applied quite generally the proper principles of feeding in swine production, but because of inactivity for the last three years, during which swine production has been unprofitable, the farmer has paid little attention to these factors, and he very likely will overlook this important matter next spring. The sow's ration should be reduced fully 50% for one or two days prior to farrowing, and that limited ration should be continued for at least a week or preferably 10 days after farrowing, to limit milk production and give the pig a chance at the start.

The pig should not gain in weight during the first 10 days of its life. If a sow is continued on a full ration, through the farrowing period, a considerable portion of the litter will be lost from scours. Scours in pigs is ordinarily, in the beginning at least, a dietary ailment induced by excessive quantities of milk. In the great sections of the country that suffered from extreme drouth the last year or two, the food stuffs produced are deficient in calcium, phosphorus and other elements. This is one of the biggest problems confronting the breeder today in drouth areas. You are aware of the need for calcium and phosphorus in the ration of the sow as well as the pigs to prevent rickets in the pigs.

Improper housing is another factor in baby pig losses. If the pigs are kept on concrete as you well know, there is a tendency for them to become anemic, so in the hog house arrangement, be certain there is a run-out on Mother Earth to obviate anemia.

Parasitism is a condition prone to occur in swine kept in filthy lots. The rotation of the lots is a necessary procedure.

LET us compare our 1936 model pig to the original wild hog. Let us begin with a gilt that is six months of age. In the morning about sun up, this gilt gets out of her bed and starts around looking for food; picks up a nut here, a whisp of grass there; turns over a stone and gets a grub; meanders down to a clear brook and obtains a drink of clean water. She travels thus throughout the day the distance depending upon the available food in the vicinity, perhaps several miles daily. This goes on until that gilt is from one to one and a half years of age. Then she seeks her mate and breeds. She will so continue caring for herself during the pregnancy period. Just before farrowing, this gilt will hunt a secluded spot, dry and clean, and make her bed. She will farrow. She does not leave those pigs for the first day or two days after farrowing. Then for the next few days she will run out a little distance, grab a little something to eat here and something there and right back to the pigs. Here is the exemplification of the proper feeding of the sow at farrowing time. This wild gilt doesn't lose her pigs from scours or other digestive disturbances. She supplies them but a limited amount of milk.

As the litter grows older, this sow travels further in search of food. Soon she must take her brood with her and travel considerable distances. In that cycle the pigs have developed a thoracic cavity by exercise and have developed their digestive tract for volume of food so it can put plenty in there to fatten.

The modern hog has been so bred as to diminish its thoracic capacity to almost a minimum, and the power of laying on fat so increased that the digestive tube is encroached upon. Is it any wonder that our 1936 model pig is so subject to pulmonary and intestinal diseases? It is a wonder that any of them live long even with coddling to reach the market.

Infectious Diseases

Twenty-five years ago, cholera was practically the only recognized disease in swine. Today, numerous swine diseases are known to prevail. However, in my judgment, cholera is still the most important swine disease.

Brucellosis.—One of the newest or rather most recently recognized diseases of swine is brucellosis. All are familiar with the fact that there are three strains of *Brucella* organisms — bovine, porcine and caprine. Swine are most frequently affected with the swine type, but they may be infected with either of the other types. The swine type may infect cattle and man, but the bovine type rarely occurs in swine. You have noticed that abortion in swine seldom occurs on farms where abortion in cattle is prevalent. It is the exception rather than the rule, indicating of course, that the swine are not very susceptible to natural infection with the bovine type of abortion germ.

The swine type of brucellosis tends to localize in the hog's body—in the lymph glands, the mammary glands, the testicles and not infrequently, in the bones. In some instances, undoubtedly sows die as a result of Brucella infection, in which the organism has become generalized.

Doctor Feldman, at the Mayo Foundation in Rochester, has described several cases of spondylitis in swine due to Brucella infection. Abortions are variable in swine. Less than a week ago, I visited a farm on which there were 120 bred sows of which 84 had aborted within three days, a rather extraordinarily large percentage. Ordinarily there are only 5% to 10% of abortions in a herd of infected swine.

Brucellosis in swine may be diagnosed by the act of abortion, but the agglutination test is a better means. This agglutination test corresponds to the same test in cattle. Ordinarily, we should eliminate all sows that have a positive reaction in dilution of 1 to 50 or above. By that method a herd of sows can be freed of brucellosis or Traum's disease in 60 to 80 days. In fact, swine brucellosis is self-limiting and in many herds disappears spontaneously within six months.

The question is frequently asked: What is the longevity or viability of the abortion germ outside of the animal? It is not possible to say, positively. It is contended by some the Bang organism, either from swine or cattle, may retain viability and virulence for two years or more in manure heaps or in cracks and crevices shielded from direct sunshine. The germ in culture tubes lives 18 months, when set away in an icebox. The Brucella organism is destroyed by desiccation and direct sunlight. Cold does not kill them. They have been subjected to temperatures of 15 to 20 degrees below zero for 400 days, and were still capable of producing typical lesions in guinea pigs.

Swine Erysipelas.—Swine erysipelas has been prevalent in the United States for many years. Theobald Smith identified the infection in 1885; V. A. Moore identified it in 1892, and Creech identified it in 1920. It has taken us 50 years to wake up to the fact that this disease might be quite widespread and constitute a swine problem.

Swine erysipelas, as an acute disease, has been recognized only since 1928. The acute type of the disease occurred extensivly in South Dakota in 1930. Since that time, it has become widespread. I don't know how prevalent it is in this state, but if it is not here now, it will be soon unless you have

better transportation regulations for swine than most states have at this time.

Swine erysipelas is of considerable economic importance and more difficult to control than hog cholera. It is caused by a germ that does not form spores and yet the soil becomes infected and appears to remain infected for an indefinite period in barns and hog houses.

In addition to swine, rabbits, turkeys, pigeons, man and cattle are susceptible to the swine erysipelas germ. We don't know much about it in cattle. In fact we know very little about it anywhere except in swine. Swine of all ages are affected, but it is most common in shotes weighing 50 to 125 pounds. Veterinarians are infected rather commonly in the Missouri Valley country.

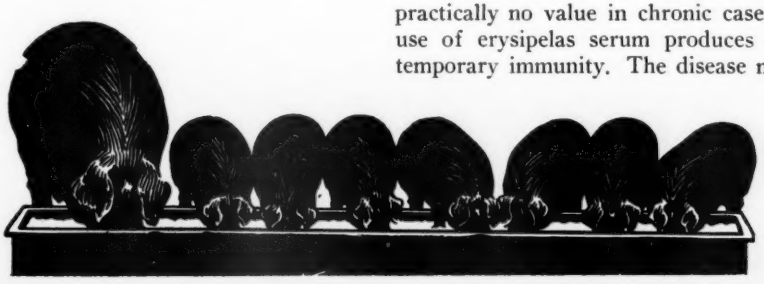
There are two types of erysipelas in swine, the acute and the chronic. Briefly, the symptoms of the acute type are: Sudden onset; usually the first thing that a man notices is a dead hog. The affected pig is usually active; when driven out of his bed, he will run about with a peculiar gait due apparently to the involvement of the articular surfaces of the joints. The gait is stilty, and different from the knuckling in hog cholera. They walk practically on their toes. They will eat a bit, although their appetite is diminished. This is a symptom to keep in mind. Temperature ranges up to 107° F. There may be vomition. Whenever gastritis is found in swine, the chances are they vomit. Vomition is not pathognomonic of erysipelas, but is a symptom that should be given consideration.

In the chronic type of erysipelas, swine are unthrifty, they are usually lame. There may be a tail or an ear sloughed off or patches of the skin may slough, or even a foot. The lesions are variable and may not be in proportion to the manifested symptoms. Areas of infiltrated, thickened skin may occur. There is usually tumefaction of the ears, snout and legs and the diamond skin lesions, that reddish area that is rhomboidal or shaped like a diamond.

Lesions in the early stages, that is, in those that die promptly, include tumefaction and edema of the lymph glands. There may be some congestion and hemorrhage in the lymph glands. There may be enteritis and gastritis. The kidneys may contain petechiae and there may be "paintbrush" hemorrhage in the serous coat of the stomach.

The diagnosis will depend upon history, symptoms and lesions. This disease is perhaps more rapidly destructive than cholera. The pigs still eat though they may show a temperature of 107° F. When autopsied, the stomach is more or less filled with foodstuff. Another diagnostic cue that is frequently of value is the apparently rapid recovery after the injection of erysipelas serum. In other words, where it is quite questionable whether or not an outbreak is erysipelas, two or three that are affected may be picked out and given an injection of the erysipelas serum. If the disease is erysipelas the chances are the three injected will be practically normal the following morning. That is a round-about method of diagnosis but very useful sometimes, particularly where the history is not clean cut and where there may be a combination of cholera and erysipelas.

The treatment in acute cases consists of the administration of serum. Serum is of practically no value in chronic cases. The use of erysipelas serum produces only a temporary immunity. The disease may re-



appear in the same herd in 20 to 30 days and revaccination may be necessary. Usually, one dose of serum will carry a herd over for a season, but there are exceptions. Don't lose sight of the fact that the immunity produced by the serum is evanescent.

Anaplasmosis-Like Disease.—There has been an anaplasmosis-like disease of swine observed in Illinois, Iowa, South Dakota and Missouri. The symptoms are depression, rise of temperature, up to perhaps 105° F. There is usually thumps, rapid shrinkage and pallor, followed by icterus of the visible mucous membrane. There may or may not be a scurvy-like condition of the skin.

The lesions are icterus, anemia, excess fluid in the various cavities, tumefaction of the spleen.

This disease is apparently not very prevalent. Anaplasmosis may be a misnomer; but in the red blood cells, there has been observed a coccoid body similar to *Anaplasma marginale* that affects cattle. There is no evidence that this disease is transmissible from cattle to pigs and it may not be transmissible from pig to pig. The disease is apparently controlled by the use of Fowler's solution or sodium cocodylate.

Vesicular Exanthema.—At the present time, this disease is confined to California. It is a specific disease, first identified in California in 1932.

This condition is characterized by vesicles on the snout and lips and between the digits and lameness or soreness in the feet. It is very similar to foot-and-mouth disease. In fact, it cannot be differentiated clinically. The vesicular fluid when injected into horses produces vesicles, but when injected into guinea pigs and cattle, it does not.

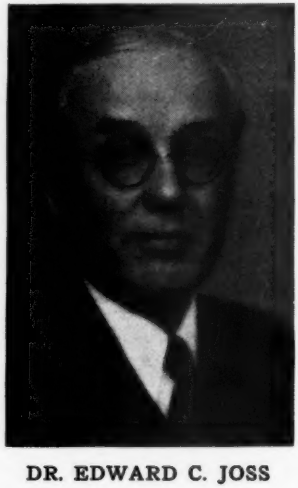
* * * *

The eastern European and western Asiatic countries have always served as a reservoir for contagious animal diseases. The only recourse the more progressive countries have is to place an embargo on animals coming from countries which permit animal diseases to thrive.—*C. H. Stange.*

NEW CHIEF OF MEAT-INSPECTION

Edward C. Joss has been appointed chief of the Meat Inspection Division of the Bureau of Animal Industry, U. S. Department of Agriculture, succeeding Dr. A. J. Pistor who died several weeks ago.

Dr. George E. Totten, who has been Inspector in Charge of the Bureau's important meat-inspection and stockyards station at Chicago, has been transferred to Washington, where he will be assistant chief of the Meat Inspection Division. Both new appointments became effective March 16.



DR. EDWARD C. JOSS

The work which these two officials are to direct is one of the most extensive regular activities of the Federal Government. It involves the thorough inspection of approximately 70,000,000 head of livestock, killed for food annually in the United States, together with resulting meat food products, in accordance with the Federal meat-inspection act. The work is conducted in about 750 establishments in the principal cities and requires a trained force of about 2,500 employees.

Doctor Joss—a native of Kansas—entered the B. A. I. in 1902 as an assistant inspector. Doctor Totten—a native of Illinois—entered the Bureau service in 1899 as assistant inspector.

Doctor Totten's transfer to Washington brought about the following changes in Inspectors-in-Charge: J. T. Jennemann from Kansas City to Chicago: C. F. Payne from E. St. Louis to Kansas City; Doctor Colford from Baltimore to St. Louis; Edw. D. Kennedy from Los Angeles to Baltimore; E. J. Cary from Wichita to Los Angeles, and S. G. Fortune from Columbus to Wichita.

Nature, Occurrence and Treatment of Rectal Procidentia In the Dog

By W. T. HUFNALL,
Houston, Texas

POSSIBLY no mishap occurring in the canine surgical clinic is more perverse than procidentia of the rectum. Possibly no other misfortune of the dog possesses such a high ratio of mortality. This alarming death rate is to be explained partially by the haphazard and impulsive manner in which many operators approach the identification of these eversions, and their mode of treatment. Let it be said in this connection that the writer is not casting a stone in the attitude of one without sin.

The erroneous conclusion that all eversions are simple rectal types seems prevalent, and maltreatment is sequential. A few of these cases do happen to be simple rectal prolapse, involving the mucosa for a short distance only. In such cases, the "rut" treatment will click, which brings to mind the fact that fate does smile occasionally, although not continually.

The treatment in vogue seems to be: First, an attempt at replacement of the protruded mass by digital manipulation, and that accomplished; a suture or two across the anal opening to facilitate retention. Persistent straining by the patient soon parts the barrier, and the operator's anxiety is relieved as to the outcome of his initial effort; and now, more impulsive than in his identification of the prolapsed mass, he follows a more radical procedure—that of amputation. Further anxiety of the operator as to the reward of his final effort is soon removed; as a rule, through the rear portals of his establishment. This reminds me of a humorous incident related by my local colleague who always called the same negro scavenger to remove dead animals from his morgue. On this occasion, the dead numbered four, a greater number than had ever been picked up in one day theretofore by the old darky, who suddenly turned to the doctor with an expression of frankness on his ebony countenance, and in droll "Stepanfetchit" dialect, inquired: "Doctuh, doesn't yu all nevah save none of 'em?" And so, this old darky's question reverberates in connection with prolapse cases—"Doctor, do you ever save any of them?"

QUITE frankly, this writer has lost his share until the denouement came in the form of findings at necropsies in three consecutive prolapse cases. The findings in all cases were identical and revealed what was supposed to have been a simple rectal prolapse, but was actually an invaginated intestine, the invagination having its point of origin in the ileum, and possible of cure only through abdominal section. This disclosure painted a hideous picture of past shortcomings and misdeeds. Further there is to be considered the insidious influence these apparently simple prolapses may have on the gullible.

These necropsy revelations quite forcibly demonstrated, or at least strongly indicated, that the greater number of what, in the past, I had assumed to be simple rectal eversions, were instead, receptacles of the hernias containing a portion of the intestine, which became involved in the amputation and suturing program.

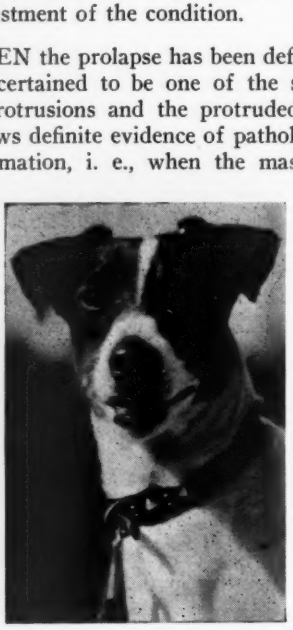
In all prolapse cases, it became imperative that a distinction be made between a simple eversion of the rectal musoca; an eversion of the entire wall, and an eversion of all the tunics of the rectum and of the intestine. The extent of pathological change undergone, resulting from its unnatural position, is also to be considered.

The simple types evidently owe their origin to a local irritation, or hyperemia. This is followed by violent straining, resulting in a rupture of the periproctal connective tissue, etc. The more aggravated types of prolapse appear in the form of an

* Presented at a meeting of the Houston Veterinary Association.

intussusception due to any of the causes that tend to hyperstimulation of the characteristic function of the rectum, or of the center of innervation in the portion of intestine involved. It is vitally important that the differentiation be made before attempting adjustment of the condition.

WHEN the prolapse has been definitely ascertained to be one of the simple rectal protrusions and the protruded portion shows definite evidence of pathological transformation, i. e., when the mass has



become congested, strangulated, friable, and easily lacerated, it is prudent to proceed, without hesitancy, with amputation of the part. When the prolapsed part is thus changed, the common method of digital replacement and suturing is not only inadvisable, but unwise; for in these instances, the replaced part acts as a foreign object, causing the animal to strain persistently and to expel it again. The result is a recurrence. Thus, all temporizing is contraindicated, and amputation encouraged when the protruded mass evidences loss of viability. To stand idly by relying upon impeditive or remote contingencies when a condition demands operative procedure is unjustifiable.

When the prolapse is recognized as an intussusception, or even suspected of being of such character, or is found to involve the mucosa for some length, preparation for abdominal section should be instituted without delay. Make an incision in the linea alba over the organ to be operated upon (celiotomy technique); explore and fully determine the nature and extent of the condition to be corrected; then carry on with such procedure as may be indicated.

In the event the prolapse is a simple one, presuming that the eversion has suffered no pathological change, proceed by withdrawing the bowel through the pelvis by slow, gentle traction and kneading pressure, the assistant caring for the return of the protrusion through the anus, coordinate with the intra-abdominal traction. Use aseptic, warm, acriflavine moistened gauze pads, free of lint and loose edging, when grasping the intestine or otherwise handling it. When the prolapse has been withdrawn through the pelvis and replacement effected, fix it in position by one or more ten-day No. 00 chromic catgut sutures (ventrofixation). These sutures should be applied with an atraumatic intestinal needle and care exercised to include only the serous and muscular coats of the intestine. This operator suspends the bowel to the left and in approximation to a celiotomy incision. There have been cases of recurrence of the prolapse where this fixation method was not employed. Failure to establish retention by this procedure will necessitate amputation, as would be primarily employed in the simple prolapse types, where the everted mass has undergone serious pathological changes.

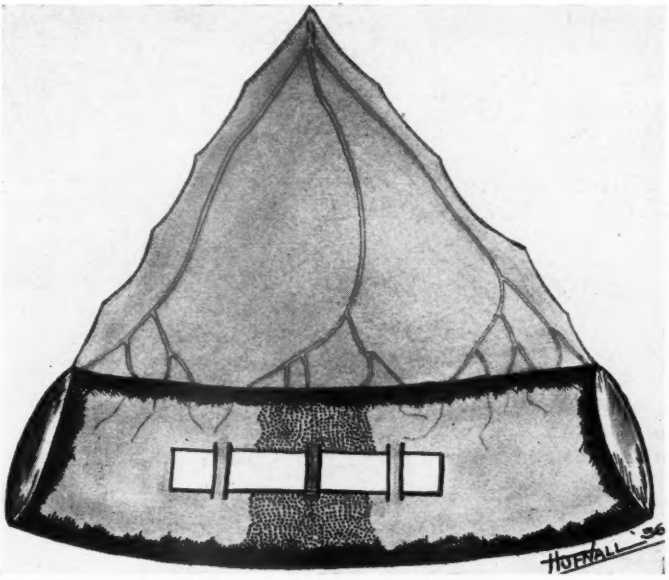
ON opening the abdominal cavity, in case of an intussusception, determine the point of invagination, which as a rule occurs in the ileum, some six to eight inches from the cecum (ileocecal class). Withdraw the involved intestine through the incision and by traction, return the invaginated bowel to its normal position. When in the natural position, I have innovated the practice of applying at least two, two-inch strips of ribbon catgut, double or triple thickness, bilaterally on the intestine (see illustration) at site of the origin of the invagination, extending it to overlap the inflamed zone. Three or more slots are

fashioned in and through the serous and muscular coats of the intestine, the flat pieces of ribbon catgut are then propelled by their own rigidity through these slots. This catgut application is used on the theory of the whalebone splint for support, maintenance of position and circulatory function, and to lessen any tendency to reinvagination.

In returning the invaginated bowel to normal position, in some instances, at the focal point of the invagination, evidence of a loss of viability consequent upon strangulation will be revealed. In such instances, at the last involuted section, a tendency of the part of fissure to the depth of the submucous coating will be noted. This requires prompt resort to entero-enteral anastomosis, with preference for the latteral method. Gangrene of the intestine, peritonitis and death will supervene if the devitalized section is not removed.

THE surgical interference in prolapse cases should be supplemented by frequent administration of small doses of refined heavy mineral oil, plain or emulsified, in a vehicle if necessary. Administration of the oil is halted on any evidence of nausea during the first three days; but is continued after the elapse of this period, regardless of nausea. The use of this agent per rectum likewise may be employed. Normal peristaltic activity should be subdued by narcotics. Water is given in small amounts at frequent intervals, or ice cubes to lick are supplied for the animal. The desideratum being that the aggregate amount of moisture supplied shall be slightly more than the normal daily liquid intake. Later, water is supplied in larger amounts and finally a bowl full may be set before the animal when manifestation of abnormal thirst has been quieted. Predigested and mucilaginous food stuffs, in judicious amounts and frequency, are permitted after 48 hours. Hypodermoclysis of saline and dextrose solutions, etc., are given as indicated and necessary.

The evidence emphasizes the necessity for surgical intervention, and the importance of differentiating between the types and causative factors in procidentia of the rectum. if improved results and more recoveries are to be expected.



RIBBON CATGUT SPLINT

In a Variety of Foods Lies Safety

By LILLA PALMER, B.S.,
Gainesville, Florida

PETS that subsist on a diet limited in variety, although they may be given as much of it as they want, are often frequenters of animal hospitals and clinics. Living in a world filled with external and internal parasites ready to make speedy attacks a malnourished condition renders the pet very susceptible and an easy prey to sickness.

If, like children, pets are taught to eat a variety of foods malnutrition may not occur. It does not follow that they must have a variety every day, but that a taste for different kinds of food should be cultivated, and over a period of time, a number of different foods included in the diet.

The reasons for this are many. First of all, all single foods are deficient in one or more necessary constituents. Two foods may be combined in such a way as to meet the daily requirements, if one has knowledge of these food stuffs and the daily metabolism needs of the pet in question, but these details are often lacking, consequently the best plan is to play safe and feed a variety, not hit and miss, but because it is a scientific fact, that furnished some elements, the body can and does manufacture certain missing food constituents.

For example, excess protein can be converted into fat or carbohydrate. In 1876 Wolffberg proved this by feeding chickens on a carbohydrate free diet. More glycogen was found in their livers and muscles than could be accounted for except that they converted some of the excess protein into carbohydrate and then into glycogen. The formation of glycogen from protein has been confirmed a number of times since, leaving no doubt but that it can and does occur. Also excess protein can be converted into fat. This may happen in two ways: with the deaminization of the amino acids the a-hydroxy or a-ketonic acids may be oxidized directly or may be converted into sugar and stored as glycogen and an excess converted into fat.

Another example of the manufacturing ability of the body is the conversion of excess carbohydrate into fat. There is plenty of experimental evidence to prove this.

Further three of the amino acids, or building stones of life can be elaborated in the body; the amino acid alanine, the amino acid arginine, and the amino acid glycine. And two amino acids, tyrosine and phenylalanine, can be used interchangeably. By a combination which is bound to result in a variety of foods the possibilities of a balanced ration are greater. There is a larger working basis. Though foods may belong to the same class no two are alike, their constituents are different and often one may supplement the other.

The health of the organs, tissues and nervous system depends in part upon the elements obtained from the food eaten. If some element necessary for blood building, iron for example; or muscle development, amino acids, calcium or phosphorus; or nerve tissue are lacking in the diet from birth or even before deficiency is bound to result. Even though an animal were born healthy, perfectly nourished in every way, a limited diet may soon bring on grave deficiencies opening the way to a vulnerable place where disease may strike and from which recovery is slow or doubtful.

MANY pet owners realizing their lack of food knowledge ask the veterinarian which ones of the prepared foods put up in cans and easily purchased in all stores are best. It is not an easy question to answer. The dog weighing fifty pounds will have a different requirement from the one weighing two pounds. The growing dog has a different requirement from the mature dog. Some manufacturers adjust their products making them suitable for the growing dog and pregnant female and the surplus elements are not harmful for other dogs but the cost of such foods is slightly higher. It would be foolish to say that these canned products are sufficient in themselves

without knowing the percentage composition of their contents and likewise foolish to say that supplements were needed with them without knowing these facts. The user can be guided by the label found on the can if it is honest and well intentioned.

OTHER foods used commonly as exclusive diets are: cornmeal, meat, milk. These are good foods but unfortunately they are not self sufficient. They should never be used by themselves. Cornmeal contains 9.2% protein, 1.9% fat, 75.4% carbohydrate, 0.018% calcium, 0.190% phosphorus, and 0.0013% iron, vitamin A, and vitamin B. The mineral and vitamin content are insufficient for the dog and exclusive use results in grave deficiency. A deficiency is found also in the proteins which are of two kinds: zein and glutelin. The glutelin is a complete protein, that is, it will promote growth and sustain life; but the zein is an incomplete protein and will do neither. Zein is lacking in two amino acids necessary for growth and life, lysine and tryptophane respectively. The glutelin in the corn while complete is not abundant enough to meet the needs unless large amounts of corn are consumed which would no doubt overtax the capacity of the digestive system and produce a lax condition of the bowels. Milk is the usual supplement used with cornmeal and other cereals such as rice, oatmeal, and whole wheat. Milk is distinctly richer in tyrosine, tryptophane, and lysine than the common run of foods which makes it a desirable supplement. There are, however, certain objections to milk. It is expensive in some localities and it is bulky containing but 12.5132% solids and 87.4868% water. The digestive tract of the dog is short and unsuited to so much bulk. Milk may be obtained in dried form either whole, skimmed or buttermilk and used in that manner does not possess the disadvantage of bulk. It contains minerals in abundance and vitamins A, B, C (variable), and G. It is, however, low in iron and if largely used must be supplemented with iron-bearing foods.

Meat contains complete proteins, minerals, some vitamins, but no carbohydrates. Since carbohydrates can be made from protein this is of no nutritional consequence. However, to convert protein into carbohydrate is expensive because carbohydrate is much cheaper when purchased as such. The chief fault of an all meat diet is the lack of vitamins. In a state of nature animals subsisted largely on meat but on a variety even so. They probably got some liver or kidney which are rich in vitamins A and B, having also an appreciable amount of vitamin C. They may have had some loin or round which has vitamin B and G. Mutton contains vitamin B but no A. Loin round or mutton while supplying vitamin B which includes G have little if any vitamin A and C. Thus under modern conditions even meat needs supplementing. Milk powder, green vegetables, alfalfa leaf, eggs are all rich sources of vitamin A and consequently are good supplements to meat diets.

Eggs, cereals, and fish are often left out of the pet's diet. This is too bad. Eggs contain good proportions of complete proteins, minerals, and vitamins especially the yolk. They are easily digested. They are good sources of the element sulphur containing it in two of its amino acids, cystine and methionine and also in vitamin B ($C_{12}H_{17}$ O N_3S. Cereals and their deficiencies have been discussed above. Fish as a supplement should not be overlooked. The bones should be removed unless canned products are used. In these the bones are soft and can do no harm. Canned tuna, mackerel, salmon, sardines and such are rich sources of minerals, vitamins, proteins (complete). Some of them contain more or less fat and some of them contain carbohydrate. And still other varieties contain iodine in appreciable amounts (the deep sea fish). However, fish like any of the other food stuffs must not be fed as an exclusive diet. It needs supplementing with vitamin B, C, and G bearing foods. It is a good supplement to other foods furnishing as it does in abundance vitamins A and D, phosphorus, calcium, and iodine. Oysters are known to contain copper which while not needed in the system is useful as a catalyst in the assimilation of iron.

Anesthesia*

By E. E. SWEEBE,
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THIS discussion of anesthesia will be confined mainly to the use of the barbiturates as sedatives and surgical anesthetics.

Ten years ago all of the barbiturates then known were considered to have essentially the same therapeutic properties. With the synthesis of many new analogues of more complicated structure, we know now that this is far from being true. The newer compounds have been definitely demonstrated clinically to have specific sedative and anesthetic action and their indications for use vary greatly.

Hypnotics are, by definition, sleep producing substances. Many groups of compounds, both organic and inorganic, have been found to possess this property of producing sleep to an appreciable degree and have been suggested for use in medicine. Of these some five survive, each having its advantages and its limitations.

1. *Bromides* are comparatively mild and ineffective in severe cases. They are used especially in general practice where a sedation of mild degree is desired.

2. *Paraldehyde,* the chief representative of a large group of aldehydes, is relatively safe but has a disagreeable taste and odor and is not readily soluble in water. Its use is limited.

3. *Chloral Hydrate* is still widely used, but it is now recognized as a parenchymatous poison particularly affecting the liver. The use of this product, therefore, should be guarded, as prolonged or repeated use of chloral hydrate will produce severe liver damage.

4. *Sulpho Methane.* Derivatives of this compound (sulphonal, trional, etc.) form metha-hemoglobin and are poorly soluble in water. Their use is limited.

5. *Barbiturates,* as a group while still by no means ideal, seem to do fairly well what clinicians, both in human and in veterinary practice, desire and yet possess a fairly wide margin of safety.

Equally pertinent for the present discussion is the fact that they offer great fields for expansion from the chemical, pharmaceutical and clinical aspects. It is in the barbiturate group that progress is most marked in the realm of hypnotics.

The Barbiturates Have Specific Indications

Experience has shown us that certain of the barbiturates are far more than simple hypnotics. Some have been found efficient as rapid acting surgical anesthetics; others are profound sedatives capable of producing, in proper dosage, not so much a deep sleep as a state of analgesia and amnesia; and many have been found to be proficient in detoxifying local anesthetics and preventing local anesthetic reaction. This important use in increasing the safety margin of local anesthetics is not of as much concern in veterinary practice as in dentistry. Local anesthetic reaction, however, occasionally occurs in veterinary practice when large doses are given, especially if, by chance, any of the local anesthetic is injected into a vein. It is, therefore, important to precede the local anesthetic injection with a barbiturate when the operation requires any large quantity of the local anesthetic.

In dentistry, nembutal is widely used for preoperative sedation to allay fear and apprehension, increase the safety margin of local anesthetics and produce more uniform results where general anesthesia is given.

In experimental animals, such as the rabbit, (on which most local anesthetics are tested for toxicity) considerably more than the lethal dose can be given if the local anesthetic injection is preceded with nembutal or neonal. Also, if an animal is in a stage of syncope or convulsion from a dose of a local anesthetic, relaxation can be produced immediately by an intravenous injection of a barbiturate.

* Presented at the 54th annual meeting of the Illinois State Veterinary Medical Ass'n, Chicago, Feb. 5-7, 1936.

In our laboratory, research on hypnotics of various types has been in progress almost continuously since 1918. More than 200 pounds have been prepared, purified and tested pharmacologically. When preliminary studies seemed to warrant, more intensive and comprehensive investigations were made—in a number of instances extending to clinical trial.

Few groups of compounds have been more intensively studied, both chemically and pharmacologically, than have the barbituric acids; yet in practice the different members of the series are all too frequently employed indiscriminately. We believe that there exist very significant qualitative and quantitative differences in a number of properties and that recent investigation is definitely upholding this viewpoint.

Fitch, Waters and Tatum recently, in the study of certain newer anesthetics, made the observation that barbiturates may be classified as "long" or as "short" acting. Barbital, phenobarbital and neonal are regarded as examples of the long-acting group; and nembutal and pernocton as members of the short-acting group. Recently a new, very short acting group has been developed, which is receiving much interest at this time. Examples are evipal and pentothal sodium (A thiobarbiturate studied clinically as No. 8064).

The long-acting barbiturates — barbital, phenobarbital and neonal—are slow-acting and slowly detoxified. Their effects may persist for periods varying from eighteen to thirty-six hours. They are eliminated mainly by way of the kidneys. Such compounds would, therefore, be contra-indicated in renal disease, and diuretics are suggested as antidotes where unduly prolonged sedation results.

The short-acting barbiturate, nembutal, is quick acting. The hypnotic and sedative effect lasts over a period of from three to six hours. This product is destroyed in the liver; therefore, its use is contra-indicated in subjects showing evidence of hepatic pathology. It has been demonstrated that nembutal is destroyed largely by the liver in six hours and entirely destroyed after 12 hours. This definitely indicates that when sedation following the use of nembutal lasts for a period of 24 to 36 hours the patient has some involvement of the liver that has prevented the destruction of the drug and its elimination.

Pentothal sodium (Thiobarbiturate No. 8064) also is rapidly destroyed by the liver. The onset of sedation or anesthesia from intravenous pentothal is instantaneous, lasting for a period of 8 to 10 minutes from a single dose; and being rapidly destroyed, the animal completely recovers in 30 to 45 minutes.

Antidotes for nembutal and pentothal sodium are strychnine sulphate, picro toxin, carmine and dextrose intravenously; and in case of respiratory arrest, artificial respiration plus CO_2, which stimulates the respiratory center in the brain-stem.

Nembutal and pentothal sodium (thiobarbiturate No. 8064) are of particular interest to the veterinarian because of the prompt onset of sedation and its relatively short period of duration; also because both products can be administered intravenously.

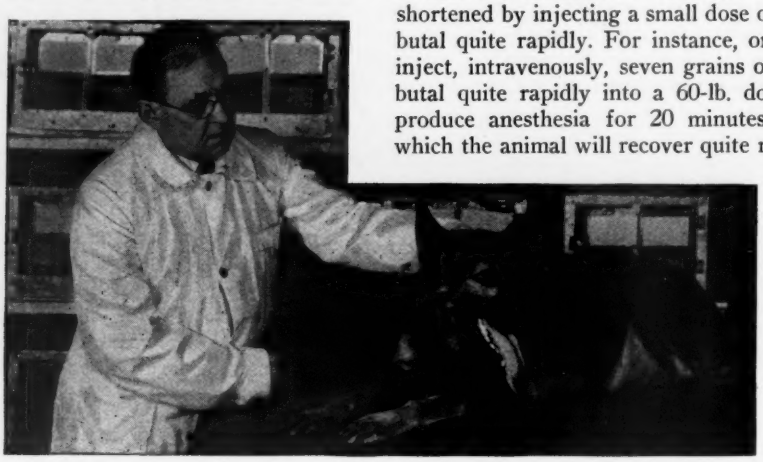
The Use of Nembutal

Nembutal is being widely used orally, intraperitoneally and intravenously in veterinary practice; however, there are indications that some practitioners are somewhat confused about the dosage and most satisfactory way to administer the product.

Orally.—Referring to the dog and cat, nembutal orally produces very satisfactory sedation; and if the stomach has been emptied previously by starvation or other means, surgical anesthesia can be effected in about one-half hour. The dosage suggestions are: Approximately one-fifth grain per pound body weight or one grain for each five pounds live weight.

Intraperitoneal injections of nembutal are widely used by practitioners for the reason that it is convenient and that satisfactory results are obtained. The objection to the intraperitoneal use of nembutal is that the dosage cannot be standardized accurately. Although we have from the beginning suggested a dose of one grain for each five pounds live weight, there are instances

where exceptions must be made; that is, when dealing with undernourished animals and those suffering from toxemia or shock, and in very large breeds the proportion of the drug should be reduced. Intraperitoneal injections are considered safe and effective if the animal is weighed carefully and the dosage is computed to one grain for each five pounds live weight up to 35 pounds and proportionately reduced when dealing with heavier animals. Seldom should one administer a dose intraperitoneally larger than ten grains.



Intravenous therapy with nembutal is, without question, the most satisfactory for uniform results. By using nembutal intravenously there is no guess-work. All of the drug is placed directly in the blood stream and the full and immediate effect is obtained. By using nembutal intravenously, injecting it slowly over a period of five minutes, anesthesia can be attained by carefully observing the eye reflex, respiration, etc. Certain operators use the dilatation and contraction of the pupil of the eye as a gauge to surgical anesthesia. This is described as follows: At the first effect of sedation from nembutal intravenously, there is a distinct dilatation of the pupil of the eye. This dilatation progresses until a certain stage in anesthesia, when the contraction is noted. The injection should be given slowly as the pupil contracts, and when the contraction reaches the size of the normal pupil or slightly smaller, a sufficient dosage has been given. In many cases less than one grain for each five pounds live weight will be required; however, surgical anesthesia will be produced and there will be no danger of prolonged sedation.

Another advantage of intravenous therapy is that the duration of anesthesia can be shortened by injecting a small dose of nembutal quite rapidly. For instance, one may inject, intravenously, seven grains of nembutal quite rapidly into a 60-lb. dog, and produce anesthesia for 20 minutes, after which the animal will recover quite rapidly.

Nembutal and Morphine

Much has been said about the combination anesthesia with morphine and nembutal, which is preferred by many operators. The procedure is to administer morphine in a dosage of approximately one-twelfth grain per pound weight either intravenously or subcutaneously; then after ½ to ¾ of an hour give nembutal intravenously, slowly, to the desired effect. The morphine-nembutal combination is preferred in certain cases and there is seldom excitement or uneven respiration with this combination.

Nembutal in Large Animals

Nembutal has been used on almost every species of domesticated and zoological garden animal, including birds.

Nembutal produces satisfactory anesthesia in both horses and cattle, however, its use is not recommended in such patients unless they can be watched carefully for several hours following the injection. These large animals have a tendency to attempt

to stand before they have attained complete control of locomotion; consequently considerable floundering will result, and possibly injury. Nembutal, however is efficient and widely used in horse and cattle

practice as a preoperative sedative in combination with local anesthetics. When it is desirous to do surgery in the standing position, nembutal will be found a great aid. A dose of 25 to 35 grains injected intravenously will put an animal "out" on his feet and with the aid of a local anesthetic the operation can be completed with ease. Such operations as poll-evil, fistula, tail straightening in horses, castration, and even removal of impacted molars, can be performed with far more ease with the aid of nembutal.

Equine Colic.—Nembutal is largely used in colics of the horse. It is purely a sedative, controlling the pain immediately and quieting the animal. In cases of spasmodic colic, the relaxation caused by nembutal is highly beneficial. Nembutal in colic will not interfere with other medicinal treatment which may be indicated in the particular case. The prompt effect obtained from its use makes a good impression upon the owner of the patient.

Swine.—Nembutal is a satisfactory general anesthetic in cesarean operations in swine. The product is given intravenously, in a dose of 0.1 to 0.2 gr. per pound weight. Such a dose produces marked sedation. The anesthesia should be completed by ether inhalation. In this way swine have been kept under anesthesia satisfactorily for an hour or longer. Nembutal and ether are far superior to chloroform or other volatile anesthetics, which have been used in the past, for swine anesthesia.

Pentothal Sodium Gives Promise

Reference has been made to a new, very short acting barbiturate, Pentothal sodium. This is one of the newer developments—a product similar in chemical structure to nembutal except that it contains sulphur instead of oxygen in the sixth position. This product is ethyl (1-methyl butyl) thiobarbituric acid. It offers many advantages for anesthesia of short duration. The margin of safety is greater than that of nembutal or other barbiturates and deep anesthesia can be produced for a period of 10 to 15 minutes with prompt recovery.

The following references where pentothal sodium has been used in human practice for anesthesia in a wide variety of cases are informative:

1. J. S. Lundy. "Intravenous Anesthesia, Preliminary Report of the use of two new thiobarbiturates." Proceedings of Staff Meeting, Mayo Clinic, Volume 10.

2. Tatum and Waters. *American Journal of Surgery.* In press.

3. Lundy and Tovel. Proceedings of Staff Meeting, Mayo Clinic, April, 1935.

4. Tabern and Volwiler. "Sulphur containing Barbituric Hypnotics." *Journal of American Chemical Society,* 1935.

Pentothal sodium (thiobarbiturate No. 8064) has been used extensively on experimental animals; and clinically on a wide variety of hospital cases.[1]

It is used intravenously exclusively, either alone or in combination with morphine and atropine. From the data which has been collected from laboratory and clinical use, the dosage varies from one-sixth to one-eighth grain per pound body weight. This therapeutic dose of pentothal, when injected intravenously, produces anesthesia immediately, which lasts for a period of 10 to 12 minutes. The animal recovers promptly with a short period of hangover. Anesthesia of this short duration has many

[1] Khuen and Sweebe. *North American Veterinarian,* January, 1936.

advantages for hospital and office use, especially for minor surgery, physical examination, X-ray pictures, etc. Should an operator desire to prolong the anesthesia of pentothal sodium, an additional amount of the drug may be given intravenously as required by the condition of the patient, or the initial dose may be repeated; resulting in anesthesia for 45 minutes to an hour.

Pentothal and Morphine

Pentothal sodium given in conjunction with morphine, produces profound anesthesia for a duration of 45 minutes to an hour. The procedure is as follows: Give from one-eighth to one grain of morphine, depending upon the size of the animal. Follow in three-quarters to one hour with the required therapeutic dose of pentothal,

one-eighth to one-sixth grain per pound body weight.

It is interesting to note, that with the use of pentothal intravenously, injections may be given with far more rapidity than with other barbiturates. It is recommended a solution of pentothal sodium be made up containing one grain per cc of which 1cc is administered for each ten pounds body weight. In a dog weighing 30 pounds, 3cc of the solution would be injected intravenously, rapidly, then an additional amount given slowly until the animal is in a state of complete anesthesia.

To date no deaths have been reported from the use of pentothal sodium. Although this drug for general anesthesia will not, in our opinion, replace nembutal, it will fill a need for an anesthetic of short duration.

Pentothal sodium is a desirable drug for producing anesthesia in cats. Approximately one-fifth to one-sixth grain per pound weight has been used with splendid results.

Pentothal sodium so far has been supplied only for clinical trial. The product is not on the market at this time. Additional clinical data are being collected on the use of the product in veterinary practice, as well as in human practice, and it is hoped to be able to offer it to the profession within the next few months.

Discussion

L. E. Day: We have used nembutal on swine, not for anesthesia in operative work but for anesthesia to investigate the lymph supply of the head and neck of swine. Of course it was necessary to keep animals under anesthesia for some time. I gave one hog 0.2 gr. of nembutal per pound weight in the vein of the ear. I don't remember exactly but it seemed to me that about the time we got half of the solution injected our pig was very much under the influence of the drug. In fact, we thought he was going to die. We wanted him to live to carry out our experiment. On the other pigs we did not inject into the ear but gave 0.2 gr. of nembutal per pound body weight intraperitoneally. All cases were under surgical anesthesia in about 50 minutes. They remained under the influence of the nembutal for about five hours and recovered with no untoward effects. One-fifth grain given in the peritoneal cavity was dissolved in approximately 1cc of water. The subjects on which we were working weighed approximately 80 pounds.

E. E. Sweebe: When giving nembutal to swine, proceed very carefully in using the dosage schedule of one-fifth grain per pound weight, especially where heavy animals are concerned. In other words, as the weight of the animal increases, there should be a proportionate reduction in the amount of drug administered, just as for dogs; that is, for a 35-lb. dog 6½ gr. is the proper dose; but for a 70-lb. dog more than 10 gr. is seldom needed.

Sheep Scabies and Navajo Indians

By ARNOLD S. ROSENWALD,
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TRAVELING on highway 66 through western New Mexico and eastern Arizona, the traveler sees stretching to the north a vast semi-arid area, dotted with forests of cedar and piñon and pine, rock formations of rare beauty, ever changing with the sun and shadows. He little suspects that great expanse has been a battle field in a war between the tiny ravager of sheep—the psoroptic scab mite—and the forces mustered cooperatively by the United States Bureau of Animal Industry and the United States Indian Service in their unceasing campaign against animal plagues in the Navajo country. A number of years ago a desperate and successful fight against that equine scourge, dourine, was waged in this same territory by the same forces of conservation. Dr. T. W. Crump described this work of dourine eradication in VETERINARY MEDICINE for December, 1929.

In the course of the past five years it has been my privilege to work at various times as an agent in sheep scabies eradication on the Navajo reservation. My station was Fort Defiance, Arizona, a Navajo Indian agency, 35 miles northwest of Gallup, New Mexico. My "range" was that portion of the Navajo country designated as the Southern Navajo Jurisdiction. My indebtedness to Drs. F. L. Schneider and H. E. Kemper, of the federal Bureau of Animal Industry, to Messrs. Tom Allen and John Divelbess of the Office of Indian Affairs at Ft. Defiance for their cooperation and help at all times is tremendous. Without it, as well as the assistance and friendly advice given me by others too numerous to mention, a greenhorn, such as myself, might never have survived the rigors which beset an inspector in that stark, barren, yet superb country.

This past summer marked a most successful consummation of an intensive, six-year compaign to eradicate sheep scabies from the Navajo reservation. It was with hard-earned satisfaction that Doctor Kemper, in October, 1935, reported, "particular attention is called to the fact that no scabies infection was found during the year in any of the flocks of sheep and goats dipped on the Navajo Indian Reservation and Navajo extensions in New Mexico and Arizona." His warning is well worth repeating too: "Although no scabies infection was found in any of the Navajo owned flocks this year, so long as an occasional sporadic case of infection appears in flocks in areas adjacent to the Navajo Reservation in both states, constant vigilance over the flocks through frequent inspections seems very essential if the sheep of the Navajos are to be maintained on a scabies-free basis."

Figures might briefly and effectively show the ruthless eradication of scab from suffering sheep. But though "figures do not lie," they can seldom tell the whole story—nor the most important part of it, the people involved, the seemingly inconsequential yet vastly significant minutae which made this campaign and which make veterinary science and life in general what it truly is.

Veterinary medicine deals with animal disease, yet it interlaces inseparably with human endeavor. And so perhaps a few sidelights touching upon the subjects of scabies eradication on the Navajo Indian reservation, the "Belecanos" (whites), the Navajos and their sheep, gleaned by an embryonic veterinarian from several seasons of sheep dipping and inspection, may prove of interest—and possibly of value.

THE Navajo country is a high terrain; rough, semi-arid; slashed by great canyons, dotted with magnificent tributes to the forces of Nature. Pests, depressions, and roads are better now than in the past, but torrential summer rains quickly change treacherous sandy washes into roaring, impassable torrents. Sunbaked clay becomes a sticky muck, yet sheep inspectors still get

Doctor Crump (right) and his lay assistant (left) explain to natives the need for the eradication of dourine from the plains' ponies.

to their vats—tens or hundreds of miles from railroads.

The spirit of the country imbues a person. One who leaves the reservation without feeling the spell of sunsets indescribable, the grandeur, the evanescent brilliance of the coloring, has failed to know the land of the Navajos.

Arriving at a dipping vat to be opened within three days, one *may* find the corrals in shape and the pump and heating plants may be ready for service. However, I have never had that experience. Usually the throttle valve of the engine is gone, or the coils, used for thermo-syphon system of heating, leak; perhaps, the vat itself is cracked, or the leathers of the water pump are worn out. Indispensable parts of a "scab inspector's" equipment are nails, (which, when filed down, are excellent substitutes for carburetor needle valves), pipe wrenches, old inner tubes—leaky joints respond well to use of a tight elastic bandage, baling wire—an invaluable material for all types of suturing—and string. A test outfit and thermometers for determining the proper strength and heat of the dipping solutions are, of course, essential.

Repairs being finally made, the vat is filled with water. Water sources may vary from small reservoirs or dirt tanks to diversion dams. The proper amount of dipping concentrate, using either the approved nicotine or lime-sulphur dip, is added. After inspection of the sheep to determine the presence or absence of scabies in the flock, the dipping commences.

ON THE inspection of the sheep for scabies many interesting anatomical and pathological conditions may be noted incidentally. The Navajo sheep often have three, four, or even six horns instead of two! Due to the untiring efforts of the personnel of the Office of Indian Affairs, purebred rams have been procured for the Navajos. With their use notable improvement in the Navajo sheep during the last few years has occurred. The incidence of open-fleeced, "hairy," bare-bellied sheep of poor market type is decreasing rapidly. During the years I was on the Navajo reservation, it became increasingly difficult to find these "Old Navajo" sheep. It is impossible to give too much credit to the earnest efforts of the members of the Indian Service to help the Navajos, as well as the fine cooperative spirit of the Indians themselves. Without this profound interest and helpfulness, the efforts of the federal Bureau of Animal Industry would be seriously hampered.

Large ventral hernias are not unusual (Fig. 4). One case of separate, distinct scrota for each of the testes in a ram, with

The pow wow ends.

the course of the penis easily discernible subcutaneously between the two sacs was seen at Tsa Lee in July, 1935. Abscesses are not rare, while occasional cases of purulent conjunctivitis and keratitis may be noted. Animals with broken legs are frequently entering and leaving the vats.

The inspections are flock examinations, and the pitfalls are many and varied, lest some cases simulating scabies—such as scars from shear cuts, treated with gasoline, or heavy lice infestations, or a nonspecific pruritus, or scabs from wounds (Fig. 6)—be wrongly diagnosed or, horror of catastrophies, cases of scab be overlooked.

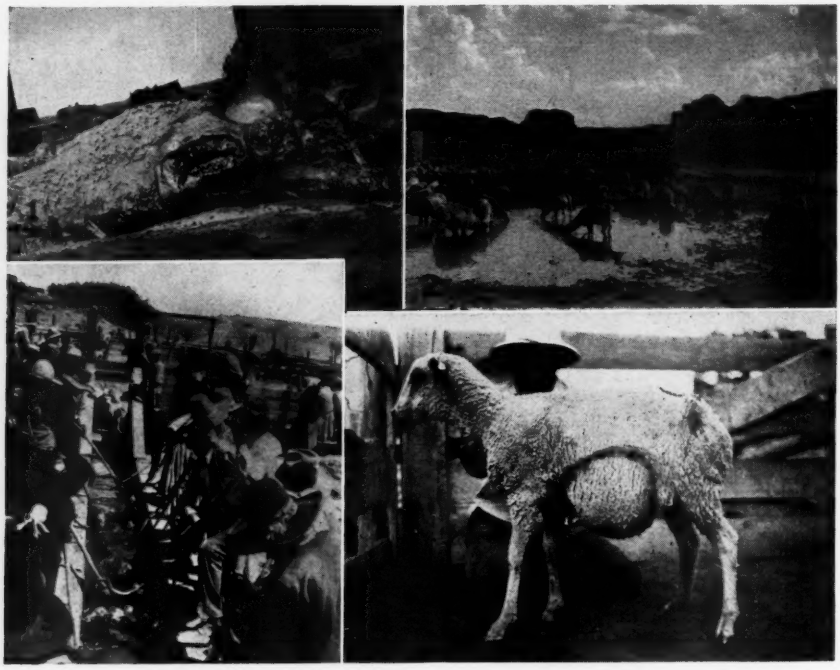
SHEEP-DIPPING is the great social event of the Navajo summer. The Indians line up along the vats to take care of the sheep (Fig. 3), in many cases so that it is impossible to cross over from one side to the other. They come many miles and may stay at the vat for the whole period. They come on foot, in decrepit cars, on burros and horseback, in wagons, with all the family. Each flock owner feeds those who help him dip his sheep and the stops for "chineago" (eating) may be frequent. At some vats the squaws tend the sheep in the vat while the men drive the animals and throw them in. At others the men do most of the work while the women cook the mutton and "squawbread," blood pudding and intestines stuffed with omental fat.

About 10 days are required to repair, fill and "dip-out" at each vat. The time taken varies with the repairs needed, number of sheep to be dipped, and the speed of dipping. At Tohatchi, New Mexico, we dipped over 20 thousand sheep in three days in 1934, holding each animal in the swim for at least a minute. In 1935 our best record was at Lower Greasewood, Arizona, where we dipped 25,689 sheep comprising 77 bands in five days. The largest number of herds dipped in a single day was 25, but they totaled only some 3000 odd sheep and goats.

LOSS of sheep during dipping varies as to cause, with drowning, due to careless handling, ranking first and internal injuries as a result of excessively rough work, a close second. At Tsa Lee this past year 17,216 head went through the "swim" without a single loss save one ewe which died four days after the dipping and showed ruptures of the duodenum and ileum, internal hemorrhage from omental vessels, and lung congestion. A frequent cause of death after dipping is generalized septi-

cemia, following wound infection through broken skin or skin torn in the vat, which on autopsy show most of the lesions of malignant edema, except that emphysema of the edematous subcutis is seldom noticeable. We lost one stag in the vat whose entire scrotum and sheath had been at-

noides in the bile ducts were demonstrable. The Navajos told me the latter are very common in lambs. Internal parasitisms would not seem to be a very grave factor due to the arid character of the country and the range method of husbandry followed. However, external parasites such as scab-



A TYPICAL SCENE ON THE RESERVATION

1, Adult "stag" affected with myiasis, following castration. 2, Navajo sheep watering at a windmill between Round Rock and Rock Point, Arizona; note waste of water; the truck was used in transporting the dipping crews during the summer of 1935. 3, Chin Lee dipping vat in use (1931). 4, Large ventral hernia in yearling ewe at Tohatchi (1935) and Howela Polacca, my Hopi helper. The hernia ring was outlined by clipping.

tacked by fly maggots (Fig. 1); others die from heart failure. In others, on autopsy, several ruptured livers (5 out of 29) were found. Debility due to parasitisus is a contributing cause to much of the death loss from dipping.

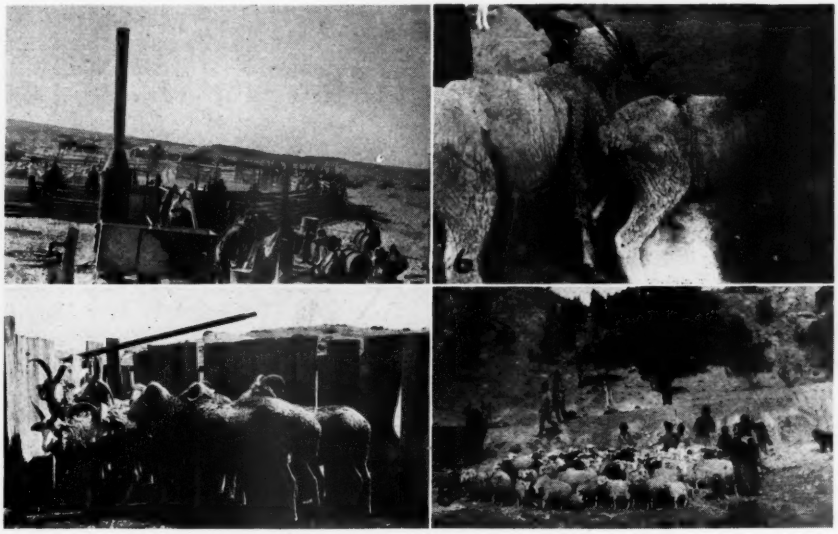
The perturbation of the natives at the loss of sheep is not great since the carcasses are immediately eaten. Hence careful autopsy is rarely possible; however, in many of the sheep which died in the vat, light infestations of *Haemonchous contortus* in the abomasum and numerous *Thysanosoma acti-*

mites, lice, and sheep-ticks, unless controlled by inspection and dipping, are very definite menaces to the principal industry of the Navajos.

IN ADDITION to eliminating scabies, the yearly reservation-wide dippings of all the sheep during the last six years has had a most desirable effect on the other external parasitisms. Unquestionably annual dippings will not eradicate such serious menaces as sheep-lice and "sheep-ticks" (*Melophagus ovinus*), but the incidence of

these pests has been markedly decreased since 1930, when the present dipping campaign was instituted. In 1934 at the behest of a friend who is a parasitogist, I was especially watchful for sheep-lice as some specimens were desired. In only four bands out of four hundred and fifty flocks of sheep inspected were the louse infestations heavy enough to collect specimens. Contrasted to the infestations in 1930, when nearly 50% of the sheep dipped were lousy, the inhibitory effect under range conditions of single annual dippings is noteworthy. A similar story could be told of the decreased infestations of "sheep-tick" during the last six years. Without annual summer dippings the lice and ticks would undoubtedly soon attain distinct economic importance. When one considers that these pests reach the height of their deleterious effect on the host in winter, at times most unfavorable for dipping, the desirability of a continuation of supervised general annual dippings of all Navajo sheep and goats is obvious.

THE ravages of sheep scabies are severe indeed! Late in January, 1931, Bureau of Animal Industry inspectors found one flock of over a thousand sheep scabby to a slight degree, and sent them to a vat 30 miles away for dipping; the owner balked and the sheep were not dipped. Early in March they were again inspected and this time almost every animal in the band was scratching, and the irritation was so intense that numbers had died. We dipped them and in the ten-day interval between first and second dipping, nearly one-half of the band died, from shock and handling in their weakened condition. Ever since, "Murderer's Son," the owner, has been one of the first Indians to come in to dip—a staunch supporter of inspection and dipping. That heroic treatment cured the scab and his



HANDLING NAVAJO SHEEP

5, The Naschiti boiler vat in use (1931); all but two of the boilers have been scrapped and gasoline engines with coils substituted to pump and heat the water. 6, A scar and the reason—aprons are used to keep the rams from breeding while they are being run with the herd and the cords frequently cause sores, which may simulate "scabies" (Rough Rock, 1935). 7, Four-horned bucks at Chin Lee vat (1931). 8, Dipping under difficulties at Upper Greasewood (1930); a small emaciated group of sheep were inspected and found scabby about 20 miles from the nearest plant, and to avoid excessive loss and damage to the animals, the metal tank shown was set up, filled by hand, heated with a fire under the tank and the sheep dipped, by lifting them into it.

"Dohta shi cha a dohta," meaning, in English, "No, my friend, Oh no!" Lo does not know where his horses are.—Photo by Dr. T. W. Crump.

sheep commenced improving immediately.

Another cause of death in the sheep is poisonous plants, the chief offenders being milkweed and rubber weed. The latter causes spewing, bloat, and some deaths, but does not seem to affect sheep which have been heavily "salted."

MY ATTEMPTS at autopsy were always well attended by the Navajos, who, through English-speaking schoolboys, asked countless questions, and expressed numerous opinions. At Crystal, I autopsied a buck which died in the vat due to drowning and the autopsy finally became a demonstration of the anatomy of internal genitals. Fortunately some of Doctor Sisson's work stayed with me well enough for me to answer questions. At Steamboat Canyon one old head man, "Hosteen Tse Tsihi," was much concerned after the autopsy of the stag with scrotal myiasis, lest I report the findings of the post-mortem examination and give the "white natoni," or "boss," the wrong impression that all the Navajo sheep were similarly afflicted.

MOVING from vat to vat involved striking camp, as each crew lived in shacks, one located near each of the various dipping plants; it was quite a chore with our equipment. A crew consisted of a Bureau of Animal Industry inspector, who was in charge of the vat, and one or two Indian assistants. My two helpers, Howela Polacca, a Hopi, and Walker Nacross, a Navajo, who acted as interpreters and stockmen, were indispensable in helping keep records, make collections, straighten out misunderstandings, and run the vat smoothly.

Almost all other work such as handling the sheep, putting the corrals in shape, etc., is done gratis by the Navajos for the Navajos. At some places, sun-shades were erected over the vats for the comfort of the workers. Cooperation on the whole is good, provided a person knows a little about the Navajo psychology which is very different from that of the "Belecano," or white man. They are a happy, simple people and contacts were always interesting and frequently instructive, though not always entirely pleasant—as when it became necessary to hold sheep in the vat by use of a "stop-gate." The objections were loud and long; but we stood firm. The use of a sand glass to determine the time obviated the dissention as to how long the sheep were being held in the vat. The instant the sand ceased to run the "gate-boy" knew of it.

THE hand is not a very good heat indicator and often arguments had to be settled by showing the correctness of the heat of the bath on a Fahrenheit thermom-

Dr. T. W. Crump, Flagstaff, Arizona, seeks information from a Navajo. "Shi beleen mizad," (My horses are a long way over there). Behind them is a hogan, the dwelling of desert Indians.

eter, after Navajo fingers had misinformed their owners that the water was too hot.

The strength of the dipping fluid is determined at frequent intervals by the inspector, using a simple field test outfit provided by the Bureau of Animal Industry. Skeptical Indian friends, however, often verified our findings by catching and casting a louse into one of the numerous puddles of dip. Death of Mr. Louse indicated that the dip was "bitzeel, ya Te," strong and good! Like all primitive men the redman wants his medicine strong.

One night at Tsa Lee a group of Indians and I were talking about sheep, treatments, diseases and many things. For some reason most of them associate fistulous withers with supra-scapular paralysis, and I attempted to explain the difference. Then the Navajos told me some of their ideas of how to tell a horse's age by the intercostal space; in an animal eight years old, two fingers may be placed in the 17th space only, while at 10 years the 16th space will also have spread enough to accommodate two fingers. One of the Navajo boys asked, "What do you do for pneumonia in sheep?" I mentioned the use of bacterins, jackets, mustard plasters, stimulants, hydrotherapy, and alkalinizing solutions, etc.—all to their amused delight. My inquisitor said, laughing, "Our treatment is much easier. We just sharpen the butcher knife."

OUT ON jobs, an inspector may be called on to doctor cut fingers, extract splinters, diagnose animal diseases, advise regarding breeding programs or troubles at the "hogan"; or to treat wounds in animals. Once at Rough Rock, I *had* to do something for the head man's horse—for next to himself, the Navajo treasures most his horse. The horse had bruised its foot on a stone, causing a tear of the hoof and removal of the quarter of the horny lamina, with attending hemorrhage. My available drugs were tincture of iodine and tooth powder. Apparently the horse recovered since his owner is still my "shikis," (friend).

Many other incidents should be recounted to complete the picture confronting a person in the round of duty. Personal grievances aired at the vat; the unnoted heroic efforts of the government men to succor cold, hungry Navajos during the "Winter of the Big Cold," 1931-1932; humorous and tragic incidents; squaws wedged fast in the vats after tumbling in; makeshifts used to keep a plant running; these are incidents

in life out there. The weary miles we have driven for a necessary repair part for a stranded automobile!

The superstitions of the Navajos are illuminating: A Navajo woman does not dare look at her son-in-law, for instance. Anything struck by lightning is "chin-déy," deviled, (this almost disrupted dipping at one vat several years ago). The fact that a hogan in which someone dies is forever

SCENES IN THE NAVAJO COUNTRY

9, Eating time; a few of the Navajos at "Chineago." 11, Receiving corrals at the Chin Lee vat (1931). 12, The author acting as relief gate boy at Lower Greasewood (1934); note the sand glass. 13, A freak burro seen at Rough Rock (1935); retouched only to show the lower leg to better advantage. The deformity is not exaggerated. 14, Nazlini vat barrels of lime-sulphur dip, each weighing more than 600 pounds; our "water boy," a heavyset, jolly ex-convict, but who proved an efficient, trouble-proof, one-man-power engine for our water pump and volunteer helpers and onlookers.

"chin-déy" may account for the nomadic character of the Navajo.

Two dances were held at the Steamboat vat—one in 1934 and the other in 1935—squaw dances arranged by the Indian chapter leaders to intrigue the young men into staying over night at the vat so that work might begin early the next day. Each year the festivities were prematurely broken up by severe rain-storms, the first in several months. Hence that group of Navajos joked us about coming earlier in the summer so as to bring rain sooner. Indian names are descriptive, some of them amusing. One veterinarian engaged in bleeding horses during the dourine campaign was named "The Mosquito" by the Navajos. Thus it goes!

CAN you then perhaps visualize the kaleidoscope that is the inspector's experience in Navajo land? Changeable weather, volatile natives, landscapes stark in their barrenness, wondrous yet terrifying in their grandeur, soothing but electrifying with their beauty. A land of contrasts, old but new, huge and wide, and great in friendliness; high and deep with history, with meaning—and perhaps prophecy. Unmentioned are the famed rugs and blankets, the ceremonial dances, the prehistoric ruins, dwellings 1200 years old, the Canyon de Chelly, a National Monument, as well as the extensive new developments at the Navajo central agency.

Neurolymphomatosis Gallinarum

By JOHN L. WEST,
Kansas State College '36,
Manhattan, Kansas

NEUROLYMPHOMATOSIS gallinarum, fowl paralysis, or range paralysis, was first reported by Marek, of Hungary, in 1907. Fourteen years later Kaupp reported the condition, in this country, stating that he had observed it seven years previously. Pappenheimer and associates proposed the term neurolymphomatosis gallinarum which signifies certain manifestations in the nerve tissues of fowls affected with a particular disease, that is by no means confined to the nerve tissue, but may manifest itself in any organ or tissue. The disease has become wide spread in this country and is one of the outstanding menaces to the poultry industry.

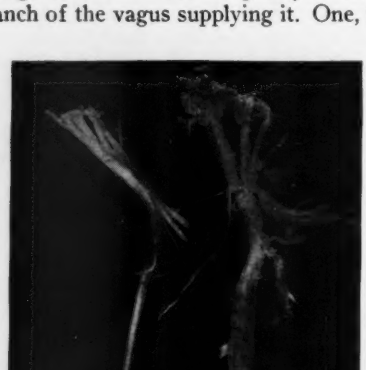
Marek described the condition as an interstitial neuritis. In the light of recent investigations it appears to be an infectious, contagious, and transmissible disease of mature or nearly mature fowls, characterized in the living state by paralysis or paresis of one or both legs or wings, and in some cases inability to support the head. On necropsy infiltration, congestion, and enlargement of the sciatic, brachial, and vagi nerves are commonly encountered. In a great many cases there is a greyish discoloration of the iris, called the "pearly" or "fishy" or "grey" eye.

The disease is probably due to a filtrable virus. It has been transmitted experimentally from affected to susceptible fowls through the intraperitoneal, intravenous, and subcutaneous inoculation with whole blood, blood filtrate, blood cells, and bacteriologically sterile emulsions of affected nerve tissue. Other factors thought by some investigators to be fully or partially responsible for the occurrence of the disease are taeniasis, ascariasis, coccidiosis, and disturbances caused by the paratyphoid group of bacteria. Experimental results strongly indicate that several conditions, leucosis, erythroleucosis, pearly eye, certain anemias, lymphoid sarcomas, and neurolymphomatosis gallinarum are but different manifestations of the same causative agent, or that they are closely related. One strain of virus upon its intravenous injection into susceptible fowls has consistently produced leucosis or lymphoid sarcomas, or both.

THE attitude of the affected bird is more or less characteristic. The first symptoms noticed in a flock is lameness of one or two birds, although greyish discoloration of the iris is frequently the initial abnormality. These birds become progressively emaciated and are unable to move. Diarrhea and atony of the crop develop. They finally die or are destroyed in one or two weeks. Later one or more of the other fowls become lame. It is seldom that more than two or three fowls are affected with paralysis simultaneously in the average farm flock. Iritis and glaucoma may be observed affecting a few or several apparently healthy fowls. Lameness may develop so suddenly that the owner suspects that the birds have been injured. One or both legs may be either partially or completely paralyzed. They are sometimes fully extended either forward or backward, with inability to move them. The wings may droop so slightly that close observation is necessary to detect it, or they may be fully extended, and useless. The iris frequently shows a greyish discoloration and does not react to bright light; the pupil being irregular and contracted.

In the early stages of the disease the bird is usually in good flesh, but in the later stages it is emaciated due to inability to obtain feed because of paralysis and of blindness. Atrophy of the affected limb or limbs is usually quite pronounced in birds that have been affected for some time. Paralysis of the neck, torticollis or opisthotonos, is occasionally observed. Upon autopsy the great sciatic nerves, brachial plexus and vagi are found to be enlarged, congested, and of a colliquative appearance. The anterior or posterior trunks of the great sciatic or both may be affected, one branch

being three or four times as large as the other. Ulcerative inflammation of the proventriculus has been regarded by some investigators to be due to paralysis of the branch of the vagus supplying it. One, two,



Ischiatic Nerves.—The nerve on the left is apparently normal. The nerve on the right is enlarged, yellowish and has lost its metallic sheen. The bird was paralyzed in that leg.—Photo by Robt. Graham

or all three branches of the brachial plexus may be affected. The nerve may be swollen to four or five times its normal size in any part due to the infiltration with lymphoid-like cells. Loss of cross striations of the nerves may be the only deviation from normal.

Lymphoid sarcomas may be found in any part of the body. The liver, spleen, heart, intestine, ovary, and kidney seem to be the most frequent locations. Their size may vary from that of a pin head to that of a medium sized marble. They are convex, more or less circular in shape, and greyish in color. Their borders may be sharply separated from the normal tissues surrounding them. The centers of the larger sarcomas are frequently yellowish, contain fluid, and are necrotic.

The liver and spleen of the bird affected with leucosis are enlarged and are a greyish color. The liver of one white giant cockerel weighed 460 grams; the spleen of a Rhode Island red hen weighed 48 grams. Lymphoid nodules are frequently found in the liver and spleen.

Not infrequently leucosis, sarcoma, and affection of the nerves typical of neurolymphomatosis gallinarum are found in the same fowl. The spleen and liver may increase in size so rapidly that the capsule is ruptured, the bird dying of internal hemorrhage. The bichloride of mercury agglutination test and the modified Guttadiaphot test have been employed as diagnostic agents but have not given consistent results.

Blood smears from birds affected with erythroleucosis show a great increase in the number of white cells so that their ratio to the red cells may be one or two or three or even more, instead of the normal one white to five hundred red cells. Smears made by rubbing the cut end of an effected nerve on a clean slide and stained by the modified Wright method shows an accumulation of lymphoid-like cells, in the nerves which are normally free of such cells.

ALL breeds of chickens show relatively the same degree of susceptibility to this disease; however, there appears to be a great variation in the susceptibility of different strains or families. A hybrid pheasant-chicken was artificially susceptible, but pheasant, geese, ducks, pigeons, turkeys, and guinea fowl, are immune. The younger the bird the greater the susceptibility, the higher the mortality, and the shorter the period of incubation. Recent investigations suggest that chicks kept in brooder houses until five or eight weeks of age then placed on range were more susceptible than chicks kept under identical conditions but placed on range at two weeks of age.

Symptoms of neurolymphomatosis gallinarum usually do not appear until the bird is five months old or even older, although occasionally typical changes in the nerves is

seen in younger birds. The period of incubation is generally considered to be two or more months.

In addition to transmission by inoculation of birds there is considerable evidence that the condition may be transmitted through the egg to the off-spring.

THE disease usually, if not always, terminates fatally. Improvement may be noted in some cases only to be followed by a continuation of the symptoms and subsequent death. No method of treatment is successful. Improvement in sanitation is recommended as a control measure. Antiseptics in the drinking water, clean pens, and houses, adequate and balanced rations, unlimited sunlight, etc., seem to lessen the prevalence of the disease. Careful selection of the breeding stock, judicious and frequent culling, with satisfactory disposal of all abnormal birds, and the purchase of chicks and setting eggs from flocks free from the disease tend to control the occurrence of neurolymphomatosis gallinarum quite successfully. Some of the experiments reported would suggest that the chicks for the replacement of an affected flock should be obtained from flocks that have a high resistance to paralysis as indicated by negligible losses following an outbreak of the disease.

THERE are approximately two-thousand fowls autopsied at this station yearly, about 10% of them being two weeks or less of age. The following table indicates the number of such fowls affected with neurolymphomatosis gallinarum, leucosis, iritis, and lymphocytomas from January 1, 1925, to February 1, 1936.

Year	Neurolymphomatosis gallinarum	Iritis	Leucosis	Lymphocytoma
1936	112	87	72	37
1934-35	116	33	71	54
1932-33	20	27	50	33
1930-31	13	10	35	48
1928-29	33	0	7	23
1926-27	3	0	4	30
1925	0	0	0	0

EVOLUTIONARY CHANGES IN VIRUS

Evolutionary changes occurring in something that is not really alive constitute a paradox arising out of the discovery, by H. H. McKinney of the U. S. Department of Agriculture, that one form of a mosaic disease of plants can change, or "mutate," into another form.

These viruses (tobacco and tomato mosaic disease) are among the most puzzling of things with which biologists have to deal. They can pass through the pores of fine porcelain filters, and cannot be seen under the microscope. They cause diseases and at the same time propagate themselves very much as though they were living microorganisms; yet in other respects they behave as though they were simply non-living chemical substances.

Recently an investigator on the staff of the Rockefeller Institute, Dr. W. M. Stanley, has produced non-living crystals of a protein substance that can cause mosaic disease in tobacco, and which appears to be the virus itself.

If this substance really is the virus, and it really is not alive, we have in Mr. McKinney's mutation observations a most puzzling state of affairs—a biological process taking place in a non-living thing.—*Science News Letter.*

The Rockefeller Institute for Medical Research reports the isolation of a crystalline protein from diseased tobacco leaves, which produces tobacco mosaic in healthy plants. These self propagating crystals of mosaic virus, according to the report are not alive but may be regarded as an autocatalytic protein. Tobacco mosaic has long been regarded as a typical virus disease. So the question is raised whether any of the virus diseases are due to living organisms.

Is it not possible that this discovery brings us a step nearer to the riddle of the origin of life? The law of evolution has carried us a long way, but so far no one has satisfactorily explained the origin of life. Is it possible that we are on the brink?

FRIEDRICH G. STEINBACH.

Wildwood Crest, N. J.

INVOLVEMENT OF THE PANCREAS IN A DOG

At our laboratories, we recently autopsied an Irish Wolfhound, male, five years old, imported about two years ago from England. The history indicated that he had had good health in England, but had never done well here. After arrival, he gradually lost flesh and ambition and became impotent. He was treated with tonics of one sort and another; also given hormones. He seemed to improve for a time. He had plenty of libido and the semen contained a few sperm cells normal in shape but without motility. He continued to lose weight slowly, becoming positively emaciated and finally died. His urine was analyzed, at different times, and found normal and his blood picture was studied with the same results.

Autopsy revealed all organs apparently healthy, excepting the heart and the pancreas. The heart showed a mild myocarditis. The pancreas was dark and greatly enlarged, weighing about eight and a half pounds. The main ducts were practically closed.

The pathologist's report stated "On cross section of the pancreas very little parenchyma was visible and the whole organ appeared a mass of clotted blood. On examining the stained slides made from the paraffin method was unable to find enough parenchymatous tissue to form any real definite opinion and there was nothing again but a mass of hemorrhage.

It seems highly probable that the pancreas had been the cause of this dog's sickness and that it had been practically functionless for months.

Textbooks tell us that without the pancreas there would be no digestion of food in man and the person deprived of it develops severe diabetes promptly. Still this dog lived on for nearly two years. A diseased pancreas in the human means sugar in the urine and the blood stream. This dog's urine and blood gave no such information.

I should like to know if this condition could have been diagnosed antemortem and if there is any treatment that would have helped the animal.

I should like, very much, to hear from anyone having information on this subject.

Goshen, N. Y. J. F. De Vine.

STATE BOARD QUESTIONS

The following are the questions asked applicants for a license to practice veterinary medicine in an examination held recently by one of the state veterinary examining board.

Anatomy

1. What is the alar cartilage? (b) The cartilage of prolongation? (c) The lateral cartilage? (d) The arytenoid cartilage?
2. Describe the anatomical make up of a living long bone.
3. What is the myocardium? (b) The myometrium? (c) The splenius?
4. What is the pericardium? (b) The pleura? (c) The endometrium? (d) The esophageal groove?
5. What is the retina? (b) The pupil? (c) The Eustachian tube? (d) The cochlea?

Physiology

1. Name two books on veterinary physiology.
2. What is the function of blood sugar?
3. Describe the composition of milk.
4. What is the action of vitamin A? (b) Vitamin D? (c) Vitamin E?
5. What is the function of the corpus luteum? (b) The Fallopian tubes? (c) The vasa deferens? (d) The gutteral pouches?
6. Describe the cardio-pulmonary circulation.
7. For what peculiarity is the pharynx of the pig noted?
8. What is the function of the membrana nictitans?
9. What are the essentials of a balanced ration?
10. Who was your professor of physiology?

Practice of Medicine

1. Name two important works on the theory and practice of veterinary medicine.
2. What veterinary periodicals do you read?
3. Describe the treatment of infectious equine encephalomyelitis.
4. What is Johne's disease? (b) Its cause? (c) Its prophylaxis and treatment?
5. Describe briefly the prophylaxis of canine distemper. (b) Hog cholera. (c) Hemorrhagic septicemia of cattle.
6. Describe the diagnosis of streptococci mastitis in cows.
7. Write a prescription for the hand treatment of scabies.

8. What are the principles of professional ethics?

Surgery

1. Describe the prophylaxis of tetanus.
2. Name the accidents and sequels of castration.
3. Describe the operation of tracheotomy.
4. In what animal is cecectomy performed and for what purpose?
5. Describe the procedure for umbilical hernia in a male pig.
6. In what form is Bang's bacillus infection manifested in the horse?
7. What is the cause of laryngeal hemiplegia (roaring) in the horse?
8. For what purposes is rumenotomy performed?

Bacteriology and Pathology

1. Define bacterium. (b) Coccidium. (c) Metazoan.
2. Define toxin. (b) Anatoxin. (c) Antitoxin. (d) Antigen.
3. Name five diseases of domestic animals caused by ultravisible viruses.
4. What is a vaccine? (b) A bacterin? (c) An antiserum? (d) Name an example of each in common use.
5. Define infection. (b) Septicemia. (c) Suppuration.
6. What is edema? (b) Dropsy? (c) Purpura? (d) Emphysema?
7. Define helminthiasis. (b) Ankylostomiasis. (c) Brucellosis.
8. Name five important anaerobic bacteria.
9. What is avitaminosis? (b) Hypoglycemia? (c) Variola?
10. Name the specific microorganism causing bacillary white diarrhea. (b) Fowl typhoid. (c) Contagious abortion in mares. (d) Necrotic enteritis of swine. (e) Actinomycosis.

Chemistry

1. What is biological chemistry?
2. Describe the analysis of urine for sugar.
3. What is acetone? (b) Indol? (c) Glucose?
4. What is the significance of the suffix "ic" in the name of an acid?
5. What is a cyanogenic food?
6. What is the common chemical antidote for metallic poisons?
7. What is an ion? (b) An alcohol? (c) A carbohydrate?
8. Name the salts of mercury.
9. What is HS? (b) H_2O_2? (c) H_2SO_3?
10. What famous bacteriologist of medical history was a distinguished chemist?

Materia Medica

1. Name the alkaloids of each of the following drugs: (a) Belladonna. (b) Nux vomica. (c) Opium. (d) Jaborandi. (e) Calabar bean.
2. Write a prescription containing three inorganic salts.
3. What is the action of iron salts? (b) Pituitary extract? (c) Normal horse serum? (d) Sodium thiosulphate?
4. What is an oxytocic? (b) A nervine. (c) A cholagogue?
5. Name five classical vaccines.
6. Name four allergic products used in diagnosis.
7. What is meant by phenol coefficient?
8. Name three important drugs made from glands of internal secretion.
9. What is the United States Dispensatory?
10. What books on materia medica have you studied?

Obstetrics

1. What is maternal dystocia?
2. What drugs stimulate uterine contractions?
3. What is the approved procedure in retained afterbirth in cows?
4. Define endometritis. (b) Pyometra. (c) Salpingitis.
5. What are the indications for cesarean section? (b) Embryotomy?
6. What is ectopic gestation?
7. Describe reposition and retention of an inverted uterus.
8. How would you handle a post-partum, uterine hemorrhage?
9. Describe the diagnosis and procedure in torsion of the uterus in a cow.
10. Name two books on veterinary obstetrics.

Sanitary Science

1. Name three diseases of dairy cows that are transmissible to man by milk.
2. Describe a plan of eliminating Bang's disease from a herd of cows.
3. What domestic animals are susceptible to anthrax? (b) What are the factors concerned in the spread of anthrax?
4. Enumerate the measures to be taken in the control of rabies.
5. To what extent has bovine tuberculosis been eradicated in the United States?
6. Explain the prophylaxis of infectious bovine mastitis.
7. What is the significance of eradicating Texas fever? (b) Explain the etiology of Texas fever.
8. Who was Theobald Smith? (b) Veranus A. Moore? (c) Alexandre Liautard? (d) D. E. Salmon. (e) Walter Reed?
9. What is the official dipping solution employed in the treatment of scabies?
10. To what extent is milk inspection conducted in the United States?

Abstracts

NEW IDEAS CONCERNING TUBERCULOSIS

The pathological-anatomical lesions of airborne lung tuberculosis indicate that the development always takes place in the form of an open tuberculosis.[27] To start combative measures one does not need, therefore, to wait for a later developmental stage. In udder and in uterine tuberculosis, however, a certain time must lapse before tubercle bacilli can be given off. Thus, the importance of udder tuberculosis as a source of infection is limited. The danger of uterine tuberculosis arises from the possibility of an intra-uterine infection of the fetus. As a source of spread, uterine tuberculosis is important. Congenital infection of calves is of frequent occurrence and constitutes the most important source of infection. When tuberculous lesions are present in calves, then the source of them has always been a uterine tuberculosis of their mothers. Alimentary infection in calves has been found to play a negligible rôle; the same applies to intestinal tuberculosis. A comparison with other animals teaches that each species of animal reacts specifically to tuberculosis infection.

The proof that a previous tuberculosis infection will result in an immunity, has not been established so far. Certain signs indicate that an immunity reaction does not take place at all, but that the changes in the reactivity of the body, mistakenly considered as an immunization, is an inherent race characteristic. It is therefore useless to put our hope upon immunity as an aid in the fight against tuberculosis.

The principal road of tuberculosis infection leads from the maternal tuberculosis via the liver, and liver lymphnodes of the calves toward generalization; and finally, via uterine tuberculosis again to the offspring. The basis for the development of the disease is a biological hereditary principle. The development takes place whenever a faulty constitution provides the required condition. Thus, a successful fight against tuberculosis must be based on the principles of heredity and constitution. Environmental influences play a certain rôle, but are effective only when the necessary constitutional conditions are given.

The postulate for the future is therefore the elimination of predisposition and the use of breeding animals of good constitution and of homozygot, tuberculosis-free, hereditary character. The measuring device for the judgement of these characteristics is the calf. Consequently, the fight against tuberculosis must start during calfhood. The means to this end lies in the designation of origin for all calves found tuberculous in abattoirs and the tuberculin testing of all living calves, with slaughter of all positively reacting calves. The mothers of infected calves are also to be slaughtered, because one of their hereditary features is tuberculosis predisposition; moreover, they are doubtlessly tuberculous themselves. A bull with a good constitution tends to lessen to a considerable extent the disposition to tuberculosis in the offspring. The continuation of the clinical examination is necessary as an aid to the racial measures.

[27] Sickmüller, E., 1935. Abkehr und Umkehr in der Tuberkulose; (Turning Point and Change of Opinion Concerning Tuberculosis). Tierarztl. Rundsch., 41:46, pp. 41:46, pp. 737-43; 41:47, pp. 753-58; 41:48, pp. 769-75.

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MINERAL DEFICIENCY IN CATTLE

In a certain section of Sweden,[28] osteomalacia, rachitis and pica are observed yearly among large numbers of cattle. The most common form is a coxitis, affecting principally milk cows. The disease occurs wherever the cows have access to swampy meadows or marsh land, or where hay from such places is fed. The lameness may occur at any season of the year. As a rule, the best milk cows are affected, either in connection with the calving or during lactation. The onset of the disease is characterized by an asymmetry of the muscles of the

[28] Svanberg, O., 1935. Über aphosphorotische Mangel-Krankheiten bei Rindern in Smaaland, Besonders über Coxitis beim Rinde; (Aphosphorosis and Coxitis in Cattle in Sweden). *Münch. Tierärztl. Wchnschr.*, 86:39, pp. 461-66.

thigh, and a slight lameness upon one hind leg. While the lameness progresses, the cows show difficulty in getting up, and they begin to emaciate. Autopsy reveals the joint cartilage partly worn away; the exposed bones exhibit erosions. It was first thought that the cause was a lack of calcium in the food, but this theory could not be substantiated by the chemical analysis, which clearly indicated that the etiological factor of the disease is a lack of phosphates in the diet. The treatment consists in adding soluble phosphates to the food or drink, and in fertilizing the swampy meadows either with superphosphate or Thomasmeal.

NEW TREATMENT FOR NEPHRITIS IN DOGS

Intravenous injection of leucotropin, an urotropin atophan combination,[29] possessing antiphlogistic and disinfection action, produces a leucopenia of brief duration, followed by a leucocytosis. The antipyretic action is quite pronounced. The speedy improvement following the use of this drug is very remarkable. Leucotropin is indicated in cases of acute nephritis as well as of chronic nephritis.

CHEMOTHERAPY IN PIROPLASMOSIS

The chemotherapeutic treatment[30] of 27 cattle suffering from piroplasmosis with Todorit, resulted in complete recovery of 26 of the cattle. The dose of Todorit is computed by weight. As much as 18cc may be given intramuscularly at one time. Twenty-four hours after treatment, the temperature falls to normal and the general condition improves markedly.

[29] Witzigmann, J., 1935. Das Blutbild des Hundes nach Leukotropin-injektion under der therapeutische Einfluss des Leukotropin bei Nieren und Blasenkrankheiten; (Leucotropin in the Treatment of Urinary Diseases of Dogs). *Tierärztl. Rundsch.*, 41:52, pp. 833-41.

[30] Yakimoff, W. L., W. F. Gouseff and A. D. Titkoff, 1935. Die Behandlung der Babesiosen und Francaiellose der Rinder mit Todvrit; (Treatment of Piroplasmosis in Cattle by Chemotherapy). *Tierärztl. Rundsch.*, 41:45, pp. 728-29.

BISMUTH IN CHEMOTHERAPY

Todorit[32] is an organic bismuth preparation, which when given intramuscularly, acts as a systemic disinfectant. One of the advantages of this drug over trypan blue is that it does not stain either the meat or the milk. The dose is 4cc for each 200 pounds of body weight. Of 27 cattle, suffering severely from piroplasmosis, 24 recovered completely when treated thus, and three died. Todorit is a product of the Sanabo-Chinoin Works.

BRUCELLOSIS IN HORSES

The clinical examination [33] of an 8-year-old gelding disclosed the presence of a tumor in the region of the withers, in spite of a well-fitting collar. Agglutination of the blood indicated a Brucella infection.

Medicinal treatment did not seem to influence the swelling. Therefore, it was decided to operate. Following the operation, recovery was complete and permanent.

Inquiry into the etiology revealed that the infection was acquired about five months previously when the horse had contact with Bang-positive cows in the stable and on meadows.

TEST FOR PASTEURIZATION OF MILK

The Schern-Gorli test[34] is a suitable means to check whether milk has been pasteurized or not. The test is especially valuable in those cases in which mixed milk is to be examined.

The Schern-Gorli reaction depends on the absorption capacity of the globulin layer surrounding the fat globules. The explanation of a negative result in case of continued pasteurization is that the heating of milk causes a hydration of the globulins, resulting in the loss of their active, surface absorptive capacity.

[32] Huber, F., 1935. Die Bekämpfung der Rinder-Piroplasmose mit Todorit; (Todorit in the Treatment of Texas Fever). *Wien. Tierärztl. Monatschr.*, 22:23, pp. 732-33.

[33] Lässer, P., 1935. Bangsche Krankheit; (Equine Brucella Infection). *Wien. Tierärztl. Monatschr.*, 22:22, pp. 703-05.

[34] Nyiredi, S. v., 1934. Beitrag zur Kenntnis der Schern-Gorlischen Reaktion; (The Schern-Gorli Test for the Detection of Pasteurization). *Zeitsschr. f. Inf.—Krkh., etc. d. Haustiere*, 46:1-2, pp. 48-50.

COXO-FEMORAL LUXATION IN DOGS

Reposition of the dislocation of the hip joint in dogs and cats should be carried out under general anesthesia, without rough handling or the application of force. Even chronic cases of a month or more duration, are amenable to reposition. If the luxation is complicated with a fracture of the pelvis, reposition should not be attempted before a lapse of 14 days, to give the fracture a chance to consolidate.

The production of an aseptic phlegmon by means of a subcutaneous injection of oil of turpentine in the region surrounding the joint is an excellent aid in the retention of the head of the femur in the acetabulum.

The use of fixation devices should not be neglected. Even though there is a danger of reluxation, the prognosis is usually favorable, because permanent improvement almost always results under proper treatment following reposition.

In these cases in which an obstacle prevents reposition, recourse to an operation is to be taken.

In chronic cases, or when the reposition has miscarried, or when the assent to an operation is withheld, then considerable improvement in the healing process can be obtained through the injection of oil of turpentine in the region around the joint.

LESIONS OF LEUCOSIS

A tumor like enlargement of one or more lymphnodes at autopsy is characteristic of leucosis.[36] Other characteristic lesions are a circumscribed and diffuse proliferation in the heart muscle, rarely in other muscles; a nodular or diffuse infiltration of the mucous membranes, especially of the abomasum and uterus and of the subserous fatty tissues. The cites of the lesions may contain large, peculiarly yellow, necrotic masses. Liver and spleen do not exhibit changes.

Transmission experiments proved to be negative, but the existence of a contagious agent cannot as yet be entirely denied. Management, feeding and individual disposition seem to play an important rôle in the cause of the disease.

THE EFFECT OF MASTITIS UPON MILK PRODUCTION

The authors' studies[37] have shown that "only a small variation exists between the pounds of milk, percentage of butterfat, and pounds of butterfat produced by opposite noninfected quarters of a cow's udder.

A considerable variation may be found between the production of opposite mastitis infected and noninfected quarters of a cow's udder.

Mastitis infection apparently reduced milk production approximately 22% and butterfat production 24% after allowing for the maximum variation found in the milk and butterfat production of noninfected quarters."

VALUE OF COPPER SULPHATE IN ANTHELMINTICS

The author[38] found sodium arsenite and tetrachlorethylene to be very variable and of a low average efficiency against *Haemonchus contortus*, even when administered to lambs in a higher dose rate than that usually recommended.

"In contrast, the combination of copper sulphate and sodium arsenite, and carbon tetrachloride in 1cc and 2cc doses to lambs gave a high average and constant efficiency.

"It is considered that the great increase in efficiency of sodium arsenite when administered in combination with copper sulphate is due to the fact that it passes directly to the abomasum, whereas when administered alone it may enter the rumen. The variation in efficiency of tetrachlorethylene is probably due to the same factor.

"Of a great variety of drugs tested against *Trichostrongylus* spp., only combi-

[35] Uberreiter, O., 1935. Luxatio femoris traumatica bei Hunden und Katzen; (Traumatic Luxation of the Femur in Dogs and Cats). *Wien. Tierärztl. Monatsschr.*, 22:22, pp. 689-700; 22:23, pp. 721-25.

[36] Dobberstein, J., and E. Paarmann, 1934. Die sogenannte Lymphadenose des Rindes; (Leucosis of Cattle). *Zeitsschr. f. Inf.-Krkl., etc. d. Haustiere*, 46:1-2, pp. 65-109.

[37] Shaw, A. O., and A. L. Beam, 1935. The Effect of Mastitis Upon Milk Production. *Jour. Dairy Science*, 18:6, pp. 353-57; also in *Jersey Bul. and Dairy World*, 54:30, pp. 893-94. Abst. in *Exp. Sta. Rec.*; 736.

[38] Gordon, H. McL., 1935. Efficiency of Certain Drugs Against *Haemonchus Contortus*, with a Note on the Treatment of Trichostrongylosis. *Aust. Vet. Jour.*, 11:3, pp. 109-13. Abst. in *Exp. Sta. Record*, 74:2, p. 257.

nations of copper sulphate and carbon disulphide and copper sulphate and Black Leaf 40 (40% nicotine sulphate) gave any evidence of efficiency.

"A single treatment with copper sulphate and Black Leaf 40 brought about a marked and permanent decrease in egg production of *Trichostrongylus* spp. in the majority of animals treated.

"In the absence of any other method of treatment for trichostrongylosis, it is suggested that copper sulphate and Black Leaf 40 should be tried."

WITHHOLDING WATER UNNECESSARY IN ANTHELMINTIC TREATMENT

It was found[39] that "as in the case of copper sulphate and carbon tetrachloride, withholding food and water for 24 hours prior to treatment had no influence on the anthelmintic efficiency of sodium arsenite or tetrachlorethylene.

"When sodium arsenite and tetrachlorethylene were given in the dose rate usually prescribed for lambs of the age of those in the experiment, an extremely low efficiency was obtained with both drugs, while a second treatment with the full adult dose of tetrachlorethylene was also unsatisfactory.

"The need for further tests as to the efficiency of sodium arsenite and tetrachlorethylene against *Haemonchus contortus* is indicated.

"It is suggested that the results obtained are due to the failure of the drugs to enter the abomasum direct in the majority of cases."

IODINE SUSPENSOID PARASITICIDE OF CHOICE

Helminth control work by the station[40] has led to the following recommendations:

"Treat all the birds worth keeping with iodine vermicide (Merck) as soon as a diagnosis of worm infestation has been made. . . . If the premises are thought to be heavily contaminated the treatment should be repeated in three to four weeks.

"For the greatest possible protection to the next crop of chickens, three treatments should be applied, the first while the birds are on the range, the second one at the time of placing the birds in the laying house, and the third one at the end of the fly season; in other words, after the frost has disposed of most of the intermediate hosts.

"If only a single preventive treatment is deemed advisable, it should be given after heavy frosts have taken place.

"Since iodine suspensoid (Merck) kills worms and worm eggs, it is obviously the ideal disinfectant for contaminated poultry houses and should be used where it is desired to kill parasites and their eggs as well as coccidia, bacteria and fungi. No other presently known disinfectant, suitable for practical use, will kill all these disease-producing organisms."

CONTROL OF RABIES

The prophylactic vaccination of the dog against rabies has proved a most practical and effective measure for controlling the disease in Japan.[42] The method was introduced in 1918 and has since been made compulsory in nearly all parts of the country. Apart from the years 1923 to 1925, when, on account of the great earthquake, control measures could not be enforced, the annual number of cases has declined from 1,041 in 1918 to 60 in 1930; the latter occurred chiefly in unvaccinated dogs. Of 1,699,518 dogs vaccinated, only 301 (0.018%) contracted the disease.

Vaccination consists of a single subcutaneous injection (5cc) of a 1:6 fixed virus suspension in phenol-glycerin water (50% glycerin and 0.5% phenol) which has been attenuated by heat at 37°C. for 72 hours. The degree of attenuation is such that rabbits and guinea pigs succumb to intracranial injection, but that it is harmless for dogs when given subcutaneously.

[39] Ross, I. Clunies and H. McL. Gordon, 1935. The Effect of Starvation on the Anthelmintic Efficiency of Sodium Arsenite and Tetrachlorethylene. *Aust. Vet. Jour.*, 11:3, pp. 106-09. Abst. in *Exp. Sta. Record*, 74:2, p. 257.

[40] Stafseth, H. J., 1935. A System of Control and Prevention of Intestinal Parasites of Poultry (Ascaridia and Tapeworms). *Michigan Sta. Quart. Bul.*, 18:1, pp. 3-5. Abst. in *Exp. Sta. Record*, 74:2, p. 263.

[42] Kondo, S., 1934. Rabies and Its Control in Japan. *Proc. 5th Pacif. Sci. Congr., Can.*, 1933, pp. 3055-60 (5 tables). Abst., in *Vet. Bul.*, 6:2, p. 132.

PREGNANCY TEST FOR MARES

During the year of 1934, 33 rabbit ovulation tests for equine pregnancy were made at Michigan State College[41] on 21 mares.

Female rabbits were given from 0.5cc to 5cc of mare serum taken from 22 to 82 days after breeding. Only three tests were erroneous when at least 1cc of serum (taken from the mare between the 47th and 82nd day after breeding) was injected intravenously into sexually mature isolated virgin does.

The rabbit ovulation test may not give positive results up to and including 46 days after breeding.

* * * *

DISEASES OF FOALS

This is a treatise[42] on the infectious diseases of foals commonly referred to as, "joint-ill" or "navel ill." Many years' study of foal diseases in Germany has enabled much material to be collected, as a result of which five separate infections have been differentiated. The examination of 232 foals in Germany showed that the relative incidence of these infections were as follows: 79 cases (34%) *Streptococcus pyogenes* infection; 59 cases (25.4%) *Bact. equirulis* infection; 7 cases (3%) *Corynebact. pyogenes* infection; 3 cases (1.3%) *Salmonella abortus equi* infection, and 1 case (0.4%) *S. typhi-murium* infection. In 83 cases (35.7%) no pathogenic bacterium was discovered.

S. abortus equi Infection.—This is contracted from the dam *in utero*; affected foals are born weak and die within 24 hours. The lesions include congestion of the liver, swollen spleen and petechia in the kidneys and heart. The joints, umbilicus and lungs are normal. No treatment is of any use.

Bact. equirulis Infection.—This is usually contracted perorally from contaminated material after birth, the foals becoming ill between the 15th and 30th days of life, e. g., those with knuckling of the fetlock, etc., are particularly liable to pick up infection from the floor. Intra-uterine infection sometimes occurs, as was proved in eight of the authors' cases.

Cases of this type of disease are commonest in April, when the weather becomes warmer and wetter. Dead foals show pyemic nephritis and focal necrosis of the liver; the lungs are sometimes altered, feeling grainy to the touch.

The organism is ubiquitous in some localities and very careful measures have to be taken to keep the foals clean at and after birth (clean straw, mare kept very clean and her udder cleansed with a mild disinfectant daily). Prophylactic inoculation of foals with 50 to 100cc of the specific antiserum immediately after birth is advised.

Streptococcal Infection. — This is the commonest type of disease and is the cause of the true "navel ill" or "joint-ill." It is most prevalent during the first 14 days of life, but cases may occur later (up to seven weeks or more after birth). Although infection *via* the umbilicus is the rule, the authors stress the fact that it may occur by the mouth also, for instance, from the infected udder of the dam. Vigorous health rather than protection against dirt is the important factor influencing susceptibility.

Purulent arthritis, omphalophlebitis and suppurative foci in the liver are the typical lesions. Prophylactic treatment similar to that advised for the preceding type is recommended. Serum treatment should be carried out on the fourth day after birth, and specific vaccination may follow it two to four days later.

Corynebact. pyogenes Infection.—This is a disease of older foals, appearing at the eighth to tenth week. It may be acute or chronic, and is characterized by respiratory disorder and a high temperature. Dead foals show large abscesses in the lungs and pale heart muscle.

Conditions predisposing to infection include dry and dusty air and warm weather.

[41] Arnold, John J., 1935. Results of a Rabbit Ovulation Test for Equine Pregnancy. *Michigan Quarterly Bulletin;* 18:1, p. 46.

[42] Miessner, H., and A. Köser, 1935. Fohlenkrankeiten (Diseases of Foals). *Dtsch. tierarztl. Wschr.*, 43, pp. 145-50. Abst. in *Vet. Bul.*, 6:2, p. 157.

The dust is stated to be the most important factor.

Non-Bacterial Disease.—Cases of fractured ribs (10), intestinal volvulus (3) and hemoglobinuria (8) are described; the latter occurred in foals 30 to 40 days old and was similar to myoglobinuria of adult horses.

VETERINARY SERVICE IN BELGIUM

J. Boes, Chief of the Veterinary Department in Belgium, has given a useful résumé[44] of the veterinary services in his country from the year 1784, when the first decree was made, followed by others in 1791, 1810, 1845, 1866, 1877, 1882, 1890 and 1922.

Until 1910, the service was under the control of the Minister of the Interior, and was then transferred to the Minister of Agriculture, with the exception of meat inspection and control of rabies.

Before 1850, the art of treating sick animals could be exercised by any person furnished with a "patente," such "patente" being obtained by proving practical knowledge before a jury constituted for the purpose of awarding decisions.

In 1855, there existed in Belgium 349 qualified veterinary surgeons, of whom 192 were in the service of the government, 28 in the army and 129 in private practice. In addition, there were 239 "marechaux vétérinaires" (really farriers) in practice; the latter gradually diminished and ceased to exist in 1910. In 1850, only veterinarians holding a diploma were allowed to deal with contagious diseases; these were recruited by the government and the Minister of the Interior fixed their places of residence and the district over which they had control. Their duties were to control contagious diseases, survey the sanitary conditions of the premises of breeders and feeders of animals, examine all suspected animals and attend all markets and fairs.

Before 1882, the principal contagious diseases controlled were glanders and contagious bovine pleuro-pneumonia. In 1880 there were recorded 508 cases of glanders and 1,718 cases of contagious bovine pleuro-pneumonia. Rinderpest was prevalent in the years 1865 to 1868, and again after the Franco-Prussian War, 1870 to 1872; from 1870 to 1873, 124,265 francs were paid as indemnities to owners of slaughtered animals. This sum was considered small and entirely due to good veterinary control, especially when compared with the loss of 400,000 animals in England during the same period.

In 1922, the diseases designated as notifiable included glanders and farcy, dourine, epizootic lymphangitis, contagious bovine pleuro-pneumonia, sheep scab, sheep pox, swine fever, rabies, foot-and-mouth disease, rinderpest and anthrax.

It is noteworthy that as early as 1897 regulations were framed to deal with tuberculosis with further amendments in 1927. In 1924, a series of measures for the control of warble flies was introduced, and the importation of livestock was placed under government control with power to enforce quarantine detention and testing with tuberculin and mallein.

A STUDY OF NEMATODES

A study[62] was made of the early developmental stages of the following nematodes parasitic in swine: *Gongylonema pulchrum, Ascarops strongylina, Physocephalus sexalatus, Metastrongylus salmi, M. elongatus, Choerostrongylus pudendotectus, Ascaris suum, Trichuris suis, Hyostrongylus rubidus, Oesophagostomum dentatum, Stephanurus dentatus* and *Strongyloides ransomi.* For two of the nematodes, however, *G. pulchrum* and *H. rubidus,* observations on the stages in the definitive host are also discussed briefly. The nomenclature of each parasite, its host relationship, geographic distribution, morphology, and bionomics of its early stages are given.

[44] Boes, J., 1935. La police sanitaire en Belgique depuis 1930 (Veterinary Services in Belgium since 1930). *Bull. Off. internat. Epiz.*, 9, pp. 754-68. Abst. in *Vet. Bul.*, 6:2, p. 184.

[62] Alicata, Joseph E., 1935. Early Developmental Stages of Nematodes Occurring in Swine. U. S. Dept. of Agric., *Technical Bulletin* No. 489, Dec. 1935; 96 pages, many illustrations. Superintendent of Documents, Washington, D. C., price, 15 cents.

"CAN THE ARMY BE MECHANIZED TOO MUCH?"

Sir John Moore Cites American Opinion

Under the above headings, *The Morning Post,* of January 22nd, prints the following letter from Major-General Sir John Moore, K.C.M.G., C.B., F.R.C.V.S.:

"With reference to correspondence which has recently appeared in your columns, on the subject of mechanization within our Army, it will be of interest to your readers to hear what American veterinary opinion is in relation thereto. In the epilogue of an important publication on 'Veterinary Military History of the United States' the authors state:

"'In the matter of transportation within the army itself, the importance of animals has been hotly debated in recent years. The internal combustion engine, on the ground and in the air, has been loudly proclaimed as the instrument of replacement. To this we yield no ground. Horses and mules in a field army will be used in the next great war, perhaps in greater numbers than ever before; no other conclusion is tenable in the light of our studies and experiences.

"'It is hoped our country may not be swayed beyond the horizon of commonsense in this significant factor of national defence. Intensifying warfare, with the ever multiplying array of machinery and ever increasing requirements for munitions that must be transported, and rations that must be delivered, will increase the need of animals to support its exploitation. In the minds of thoughtful commanders, machinery is but an auxiliary to the arms.

"'The Doughboy is the determining factor now as formerly, and in the supplies brought to him over the last ten miles of a God-forsaken terrain by animals, lies his principal hope of achieving his objective. Both trudge, flounder, scramble, crawl and climb, through rain and snow and fog, over forbidden terrain, while mechanical auxiliaries await favorable situations that may not develop.

"'There are forces of nature yet to be overcome before the army horse and the army mule yield their places in the military service. Past wars have not been, and the future wars will probably not be, fought under a high "ceiling" and over firm terrain, unencumbered by obstacles insurmountable to any vehicle the ingenuity of man has yet devised. The mind reverts to the south slope of Little Round Top, where an important cavalry charge was made during the Battle of Gettysburg, or the morass of Bannockburn, or thousands of square kilometres of mire and forest in the Somme and in the Argonne.

"'Peace-time maneuvers are held on areas selected for the purpose and at a season when inclement weather is least likely to interfere, and yet within a year such maneuvers were held up for a whole day, in Western Texas of all places, to wait for the surface to dry following an unexpected rain. Nor is the nearly two weeks during the winter of 1935, when planes could not leave the Chicago Municipal Airport, so soon forgotten.'"—*The Veterinary Record,* 16:6, Feb. 8, 1936; p. 165.

INTERNATIONAL CONFERENCE ON FEVER THERAPY

The first international meeting on fever therapy will be held in New York City, September, 1936. The use of fever induced by physical and other agencies as a therapeutic procedure has received much attention in the past few years. The conference will aim to collect and crystallize available data in this field. Therapeutic, physiological and pathological phases of fever will be discussed. The suggestion for this conference originated with a group of interested European physicians.

Further information concerning the conference may be obtained from the Secretary, Dr. William Bierman, 471 Park Avenue, New York City.

THE HUMANE CALENDAR

The receipt of the Humane Calendar issued annually by the Toronto Humane Society is eagerly welcomed by an ever widening circle of admirers and well-wishers of that association. The calendars are always unique in concept, always artistic and never fail to teach kindness to animals, stressing their service to man and emphasizing their merit at his hands. The calendar for the current year excels all predecessors in beauty and instruction. Each of the 12 months carries a fine, 7x6 inch colored print of "Servants of Man" at work—The Husky, Yak, Llama, Water Buffalo, Dog, Police Horse, Oxen, Work Horses, Elephant, Zebra, Camel and Reindeer, with an appropriate descriptive paragraph. Dr. J. A. Campbell, widely known small animal practitioner, is a director of the society.

PROFESSOR WILLIAMS HALE AT 80

The faculty of the New York State Veterinary College at Cornell University and intimate friends of Dr. W. L. Williams, emeritus professor of surgery, gave a party in his honor on the occasion of his eightieth birthday, February 26th.

Doctor Williams retired 15 years ago. Notwithstanding his age, his health is good and his interest in veterinary matters continues unabated. He goes to the college almost every day, continuing his study of the diseases incident to breeding. During recent months he has been revising his text book on "Diseases of Breeding Cattle," and at this time, has the manuscript practically ready for the printer.

LIVESTOCK PRICES BEST IN THREE YEARS

Average farm prices of livestock and livestock products were 39% higher in 1935 than in 1934, they were 61% higher than in 1933, and 60% higher than in 1932, according to the Bureau of Agricultural Economics.

All livestock commodities except wool sold much higher in 1935 than in 1934. Meat animals were up 68%; chickens and eggs, up 35%; work animals, up 15%, and dairy products, up 13%. Prices received by farmers for wool were down 11%.

Outstanding gains were made in prices of hogs during the past year, the average farm price being $8.36 per 100 pounds liveweight, compared with $4.14 in 1934. This marked advance is attributed chiefly to "abnormally low market supplies of hogs."

Cattle and calves advanced sharply in price, with beef cattle averaging $6.21 per 100 pounds in 1935, compared with $4.16 in 1934, and veal calves $7.10 compared with $4.84. Prices for sheep and lambs advanced, largely in response to the general shortage of meat animals in 1935 and to improved demand.

Of the dairy products, butterfat advanced most sharply in price from 22.7 cents per pound in 1934 to 28.1 cents in 1935. The advance in butter prices is attributed to improved consumer demand and a material reduction in edible fats.

HORSE AND MULE POWER

A new edition of the booklet, "Horse and Mule Power in American Agriculture," by the versatile secretary, Wayne Dinsmore, of the Horse and Mule Association of America, is ready for distribution. It is a compelling exposition of the advantages of the farm that is self-contained so far as power and replacement of power units is concerned.

Excellent as is the text and sweet as its music to the ears of veterinarians, the illustrations will receive first consideration from every reader. They are thrilling, magnificent; showing horses and mules in fairs, shows, pastures, sales rings and pulling contests; at work and at play; used in industry and in recreation by both children and adults.

Every veterinarian in general practice will want a copy for the inspiration and information it contains. He will need it for the reference matter it makes readily available; minute directions for arranging the various multiple hitches for large and not so large power units; tables of feed requirements for animals of different size, in idleness, light and heavy work; drawings for eveners; the economies of horse power as compared with mechanical power, etc.

Dinsmore is too well informed, and too vitally concerned with the welfare of the industry, to have adopted the everyman-his-own-horse-doctor program of the Agricultural Extension Service. Not the least valuable part of the booklet is instructions to the farmer as to when to call his veterinarian to conserve his power and his investment.

The booklet, 72 pages, is supplied at 10 cents per copy, little more than the cost of mailing. Order from the Horse and Mule Association, Chicago. Better get your copy now and have it for use this spring. To save yourself trouble, make your order for half a dozen copies, since as soon as you see it you will want to place some copies in the hands of clients.

HORSE AND MULE STATISTICS

This estimate of the U. S. Department of Agriculture of the numbers of horses and mules in the United States Jan. 1, 1936, reports 11,637,000 horses and 4,685,000 mules, a decrease of about 2% in horses and 3% in mules.

The number of horses over two years old decreased 4%, but there was a further substantial increase in colts under one year old, i.e., foaled in 1935.

The value per head of all horses and colts on Jan. 1, 1936, was $96.79 compared with $77.05 on Jan. 1, 1935. This was the highest Jan. 1 value since 1921. The total value of horses this year was $1,126,400,000 compared with $913,870,000 a year ago.

Although the number of mule colts under one year old increased, it was more than offset by the decrease in mules over two years old. The value of mules on Jan. 1, 1936, was $120.42 per head compared with $99.34 a year earlier. The total value of all mules was $564,186,000 compared with $478,998,000 a year ago.

Commenting on this report Wayne Dinsmore said: "The significant point is that horse production is definitely on the upgrade, as horse colts under two years of age totalled 1,097,944 when the census was taken Jan. 1, 1935, an increase of 140,670, or more than 14%, over colts of the same age reported by the census of 1930.

"But mule colts are still down—only 110,967 mule colts under two years found on Jan. 1, 1935, a decrease of 57,378, or 34% fewer than mule colts of the same age, reported by the census of 1930.

"Boiled down and bluntly stated, the facts are that we are still short on both horse and mule colts for replacements. Granting horses an average life of 15 and mules 18 years, we will lose by death 775,800 horses and 260,277 mules in 1936, whereas replacements rising three years old, figured at half the colts under two years on Jan. 1, 1935, amount to only 548,972 horses and 55,983 mules, even if none died in 1935. In other words, where we have

10 horse colt replacements, we should have 16; where we have 11 mule colt replacements, we should have 52. Therefore we are short at least 226,828 horses, and 204,294 mules, coming three years old this spring, as compared with what we need for bare replacements to step into the place of horses and mules to die in 1936. As a matter of fact, losses by death will be even greater than indicated above, because more than a normal number of horses and mules are advanced in age."

CHARLES W. WILLIAMS

The death, February 18, of Charles W. Williams at his home in Aurora, Ill., ended the spectacular career of a man whose fame was known to every horseman and race meet promoter. Born in New York in 1856, Mr. Williams moved with his parents to Buchanan County, Iowa in 1856. At his first job at a general store at $5.00 per month, Williams saved up $60.00 to buy a colt. He worked as a railroad telegrapher, became big butter and egg man, and is said to have originated the first packaged butter, in 1881.

Williams sold his creamery interests to go into the horse business with a gelding that was a fair trotter and two well-bred mares, Lou and Mabel. Buying another mare, Gussie Wilkes, lame but well bred, for $75.00 he shipped the three to Kentuck to be bred. Lou produced Axtell; Gussie foaled Allerton; both became world champion stallions. Axtell, 2:12, established a new world trotting record for stallions of any age and was sold to a syndicate for $105,000.00. He was retired to the stud at a service fee of $1,000.00 by his new owners. His son, Axworthy (2:15½) had four foals in the two-minute list—lee Axworthy (1:58¾), Arion Guy (1:59½), Mr. McElwyn (1:59¼), and Guy McKinney (1:59½). Axtell, through his son Axworthy, has left an imperishable heritage to followers of the trotting world. When Lou foaled Axtell by William L. whose sire, George Wilkes, sprang from the mighty Hambletoniam, she blended the best blood of the Mambrino line with that of the fountain head of trotters. Allerton, 2:09½, world's stallion record, Sept. 19, 1891, did not endow his progeny with his great racing ability as did Axtell. He met and conquered Nelson, Delmarch, and McDoel, but lost to Nancy Hanks.

Charles W. Williams built Rush Park and the famous kite shaped track at Independence, Iowa, in 1889 at a cost of $10,000 His race meetings attracted horsemen from all over the world; daily attendance reached 40,000. The track extended north and south with the small loop to the north. Commencing at the turn of the small loop there was a straight stretch of 500 feet for scoring. The track was 75 feet wide on the straightaways and narrowed to 60 feet around the great turn. This enabled ten horses to score abreast. The stretches were 1574.743 feet and the turn 2130.514 feet long. Several surveys showed the track to be 1.76 inches over a mile. The kite-track, located on low swampy ground, had a peat-bed foundation. The surface yielded readily to manipulation, so that the track could be put in superlative condition in half a day. The first meet was held July 4, 1890. At the grand opening Aug. 26, 1890, there were 225 horses valued at over one million dollars. Big purses and a fast track kept Rush Park popular until the non-skidding bicycle sulky nullified the principal advantage of the kite track. The last meet was held at Rush Park in 1904.

The following records were held by the track:

World Record	*Horse*	*Time*
Trotting,	Nancy Hanks	2:05¼
Trotting in race,	Martha Wilkes	2:09½
Pacing in race,	Flying Jib	2:07
Yearling pace,	Belle Acton	2:22½
Two-year-old pace,	Online	2:16
Three-year-old pace,	Manager	2:11½
Stallion racer,	Direct	2:06
Five-year-old stallion trotter,	Allerton	2:09¼

Williams established the American Trotter, a nationally-known race horse paper.

Caught in the financial panic of 1893, Williams turned over all his property in Independence, excepting a few horses, to his creditors. In 1894, he went to Galesburg, and after conducting races and breeding trotters, he traded his horses for Canada land. He then engaged in evangelistic work, conducting meetings in many cities. In 1925, he moved to Aurora, where he established a stock farm and raised Hereford cattle. His Axtell-Hereford cattle have been called the most royally-bred herd of Herefords in the world. For the last two years they have brought the highest prices in the world's markets, one cow selling for $5,700.00.

The funeral services were at the Presbyterian Church in Independence, Iowa, Feb. 22, 1936.

BIGGEST CATTLE STATE NOW MODIFIED ACCREDITED AREA

March 2 the U. S. Department of Agriculture designated Texas as an area practically free of cattle tuberculosis. It is the thirty-eighth State to be classified as a modified accredited area. Texas not only is the largest State in the Nation, but it also has more cattle than any other State—more than seven million of all classes.

The necessary facilities for State-wide testing were made possible through the use of Federal emergency funds provided for cattle-disease control and cooperation of livestock owners with State and Federal officials during the last 20 months.

ARMY VETERINARY SERVICE

Each of the following-named first lieutenants of the Veterinary Corps is relieved from further assignment and duty at the station specified after his name, effective in time to proceed to Washington, D.C., and report to the commanding general, Army Medical Center, on or about August 28, 1936, for duty for the purpose of pursuing a course of instruction at the Army Veterinary School.

Velmer W. McGinnis, Fort Leavenworth, Kans.; Daniel S. Stevenson, Fort Hoyle, Md.; and James B. Nichols, Fort Oglethorpe, Ga.

Each of the following-named first lieutenants of the Veterinary Corps is relieved from further detail as student, Medical Field Service School, Carlisle Barracks, Pa., effective in time to proceed to Washington, D.C., and report to the commanding general, Army Medical Center, on or about August 28, 1936, for duty for the purpose of pursuing a course of instruction at the Army Veterinary School.

Bernard F. Trum; John H. Rust, 3d; Andrew J. Sirilo.

1st Lieut. Lloyd C. Tekse is relieved from duty at Fort Francis E. Warren, Wyo., effective in time to comply with this order; is assigned to the Army Medical Center, Washington, D.C., will proceed at the proper time to San Francisco, Calif., and sail on the transport scheduled to leave that port on or about August 11, 1936, for New York, N. Y.; upon arrival in New York City, will proceed to Washington, D. C., and report to the commanding general, Army Medical Center, for duty for the purpose of pursuing a course of instruction at the Army Veterinary School.

Major George L. Caldwell is relieved from further assignment and duty as student, the Quartermaster Corps Subsistence School, Chicago, Ill., effective in time to comply with this order, will then proceed to Washington, D.C., and report not later than June 30, 1936, to the Surgeon General for duty in his office.

Major Oness H. Dixon, Jr., is relieved from further assignment and duty as student, the Quartermaster Corps Subsistence School, Chicago, Ill., and directed to proceed to Fort Benning, Ga., and report not later than June 30, 1936, to the commanding general for duty.

Captain Charles S. Greer is relieved from further assignment and duty at the remount purchasing and breeding headquarters, Lexington, Ky., and additional duty at the University of Kentucky, Lexington, Ky., effective in time to proceed to the Robinson quartermaster depot, Fort Robinson, Nebr., and report not later than June 30, 1936, for duty.

Major Charles O. Grace is relieved from further assignment and duty at Ft. Benning, Ga., effective in time to proceed to Lexington, Ky., and report not later than June 30, 1936, to the commanding officer, remount purchasing and breeding headquarters, for duty.

Veterinary Reserve Corps

New acceptances—First Lieutenants — Bonaci Alexander Joseph, 2420 4th Ave., Seattle, Wash.; Brook, Jesse Clyde, Sale City, Ga.; Carey, Roy Thomas, 6318 41st Ave., S.W., Seattle, Wash.; Hughes, Emory Geo., 512 Range St., Mankato, Minn.; Kraus, Ernest Edmund, 405 Cottonwood Ave., Las Animas, Colo.; Kress, Joseph David, c/o Henry Clay Hotel, Ashland, Va.; Kuhn, George Anson, 220 Federal Bldg., Spokane, Wash.; McIntosh, John Pierce, 108 Franklin Sq., New Britain, Conn.; Nottingham, Melivn O'Dell, Fowlerton, Ind.; Pascua, Manuel Rivera, Bureau of Animal Industry, Manila, P. I.; Pearl, Martin David, 1122 W. Somerville Ave., Phila., Pa.; Peterson, Harold Octavius, Box 536, New Brunswick, N. J.; Werrin, Milton, 5720 N. 5th St., Philadelphia, Pa.; and Young, Clarence Clinton, North Pecan St., Nacogdoches, Texas.

New assignments to active duty with CCC.—First lieutenants; Morse, Joseph B., Hq. Third Corps Area, Baltimore, Md.; Clark, Virgil H., Ft. Crook, Nebr.; Prchal, Charles F., Ft. Snelling, Minn.; Reineccius, Jake L., Ft. Snelling, Minn.; and Hoyt, Kenneth R., Seattle Q.M.D., Seattle, Wash.

First Lieutenants—Boydston, Earl Gustave, Clayton, Mich.; Garlie, Adolph Oliver, 448 Roy St., St. Paul, Minn.; Howe, Nelson Scott, Jr., Covert, Mich.; Jones, William Robert, Route No. 1, Box 10, Kirkland, Wash.; Lusco, Robert Paul, 1030 Center St., Birmingham, Ala.; McChesney, Gerald Harry, care Dr. J. S. Healy, 330 Federal Bldg., Madison, Wis.; Manthei, Chester Alfred, 345 West 2nd St., Elyria, Ohio; Peck, James Eugene, care Dr. Ralph Graham, Box 627, Jefferson City, Mo.; Powell, Thomas Maurice, 319 Hanford St., Columbus, Ohio; Rogers, Warren Brown, Kerrville, Texas; Seely, Leigh Harris, 1 E. Main St., Sidney, N. Y.; Veenstra, Robert John, R. R. No. 6, Grand Rapids, Mich.; Whitfield, John South, Greenwood, Miss.; Young, Kenneth Simon, 4631 Lake Park Ave., Chicago, Ill.

Promotions:

Captains—Hoon, Henry Ross, 48 N. E. Stafford, Portland, Ore. Gillie, Geo. W., 412 Calhoun St., Ft. Wayne, Ind.

Majors—Parker, Carl, 734 S. W. Blvd., Kansas City, Kans. Patton, John A., 144 West Duluth Station, Duluth, Minn.

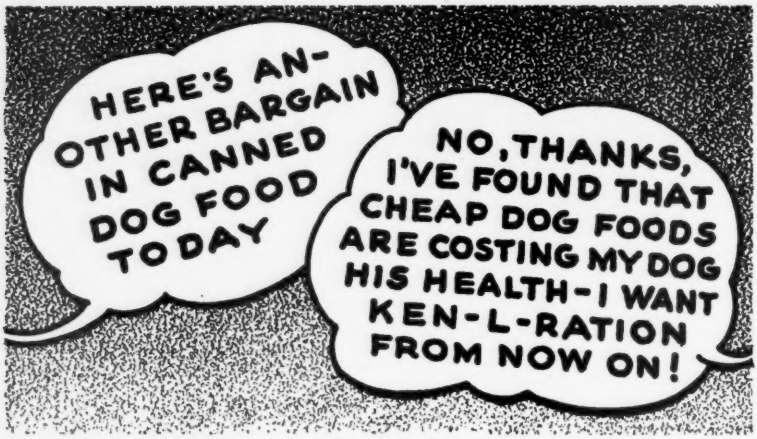
Lieutenant Colonels—Robertson, Robert James, 775 W. Patterson Ave., Glendale, Calif.; and Wright, Charles Clinton, P. O. Box 333, Kenton, Wash.

New Assignments to Active Duty with CCC

First Lieutenants—Carll, Walter T., N. Y. Port of Embarkation, Brooklyn, N. Y.; Wendell, Carl E., Ft. Sheridan, Ill.; Leenerts, Theodore H., Presidio of San Francisco, Calif.

Termination of Assignment to Active Duty

First Lieutenant—Goodman, Simon J., Hq. 3rd Corps Area, Baltimore, Md.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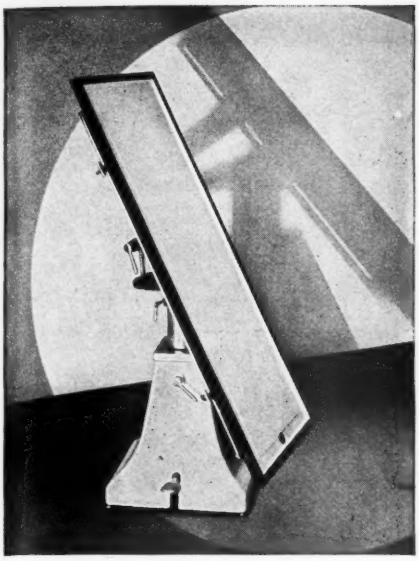

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George A. Ferguson, Leaksville, North Carolina, has recently been appointed city veterinarian for Reidsville, North Carolina. For a number of years, Doctor Ferguson has taught chemistry and bacteriology in the Hospital Training School for Nurses at Leaksville. He will continue his teaching in addition to his work as city veterinarian at Reidsville.

* * * *

SOUTHERN STATES MEETING

The twentieth annual meeting of the Southern States Veterinary Medical Association was held at Atlanta, Georgia, November 7-9, 1935. Guest speakers on the program included: H. J. Shore, Fort Dodge, Iowa; J. C. Flynn, president of the A. V. M. A., Kansas City; E. J. Frick, Manhattan, Kansas; A. E. Wight, Washington, D. C.; B. M. Lyons, Pearl River, N. Y.; T. A. Sigler, Greencastle, Indiana; Mr. H. R. Smith, Livestock Commissioner, Chicago, Ill., and Benjamin Schwartz, Washington, D. C.

Officers elected for the ensuing year, were: L. J. Kepp, Atlanta, Georgia, president; R. R. Sally, Orangeburg, S. Car., first vice-president; W. D. Hiscock, Orlando, Fla., second vice-president and M. R. Blackstock, Spartanburg, S. Car., was reelected secretary-treasurer.

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* * * *

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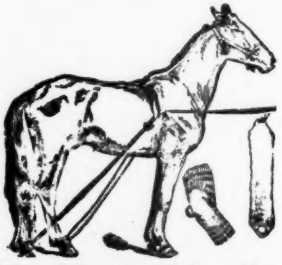

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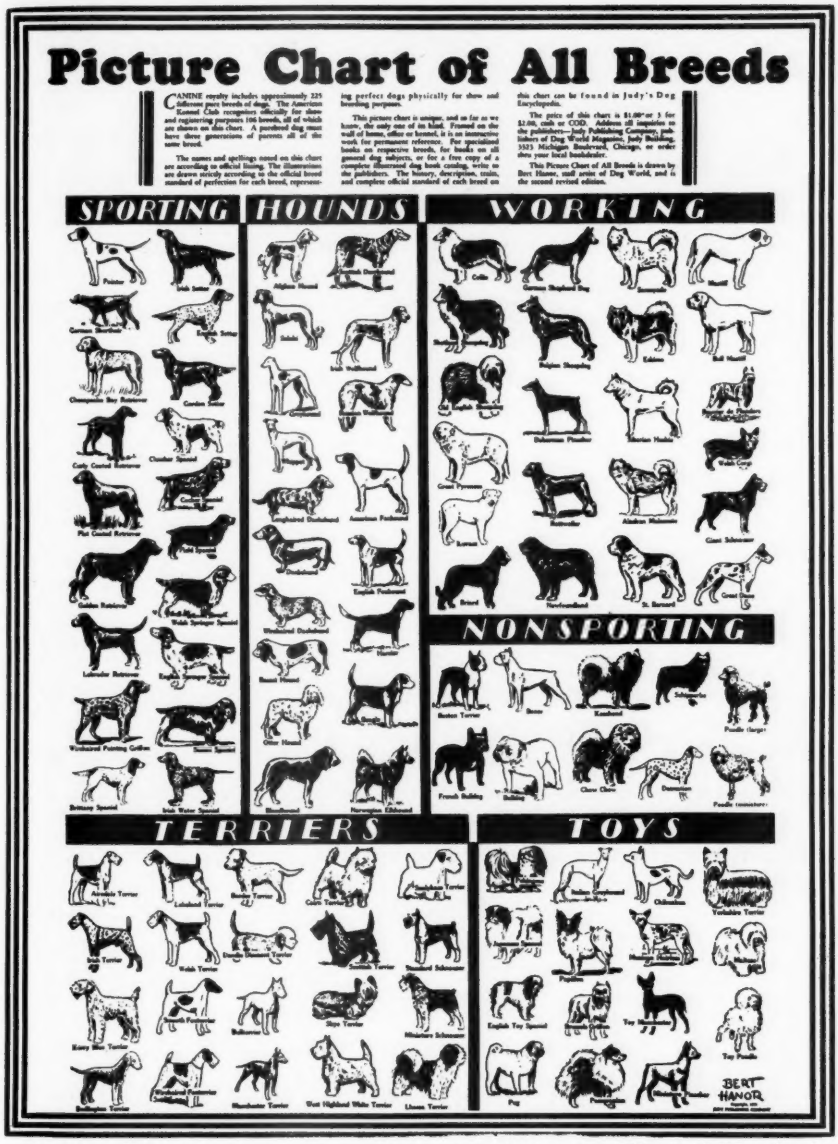
Picture Chart of All Breeds
CANINE royalty includes approximately 225 different pure breeds of dogs. The American Kennel Club recognizes officially for show and registering purposes 106 breeds, all of which are shown on this chart. A purebred dog must have three generations of parents all of the same breed.
The names and spellings used on this chart are according to official listing. The illustrations are drawn strictly according to the official breed standard of perfection for each breed, representing perfect dogs physically for show and breeding purposes.
This picture chart is unique, and as far as we know, the only one of its kind. Framed on the wall of home, office or kennel, it is an instructive work for permanent reference. For specialized books on respective breeds, for books on all general dog subjects, or for a free copy of a complete illustrated dog book catalog, write us the publishers. The history, description, traits, and complete official standard of each breed on this chart can be found in Judy's Dog Encyclopedia.
The price of this chart is $1.00* or 3 for $2.00, cash or COD. Address all inquiries to the publishers—Judy Publishing Company, Publishers of Dog World Magazine, Judy Building, 1523 Michigan Boulevard, Chicago, or order thru your local bookdealer.
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This chart, 19x24 inches in size, arranged with colored border, is suitable for framing for the office wall or for use as received. The American Kennel Club recognizes officially for show and registration purposes, 96 breeds of dogs. All of these and 10 other breeds are shown in this chart. The names and spelling on this chart are according to official listing, and the arrangement of the dogs in classes is a distinct advantage. The illustrations are drawn from the official standard of perfection for each breed. It is the answer to the oft repeated question: "Doctor, what breed is he?" "There are the standards for all breeds; pick him out," would be your reply. The chart is highly useful, informative and authoritative. **Price: Single Copy, $1.00 prepaid. Three Copies, $2.00 prepaid.**

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THE VETERINARY ASSOCIATION OF MANITOBA

The annual convention of this association was held in Winnipeg, February 6th, there being a good attendance of members from all parts of the Province.

In his opening address the president referred to the amount of quackery on the part of unqualified men in various parts of the province and suggested that an effort should be made to obtain greater assistance from the Attorney-General's Department in conducting prosecutions.

A motion was passed endorsing the action of the Executive Council in connection with complaints received of unethical advertising and publicity in the press by a member.

The standing committee to interview the Provincial Government were instructed to take up the question raised at a meeting of the Western Live Stock Breeders Association as to whether the Live Stock situation in Western Canada did not warrant assistance to the veterinary profession on the part of Federal, Provincial or City Governments.

Papers were presented by:

J. K. Morrow, Winnipeg; H. N. Thompson, Virden; A. Savage, University of Manitoba; J. A. Allen, Winnipeg; J. A. Martin, Sperling, and E. J. Rigby, Provincial Board of Health, Winnipeg.

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Dr. Naylor Dilators fit either large or small teats without overstretching or tearing, are easy to insert and stay IN the teat. They carry antiseptics and healing agents into teat canal to combat infection and promote healing. The dilators themselves are Sterilized, Soft, Absorbent dressings which protect the inflamed area, absorb inflammatory exudates and keep teat canal open in its natural shape while tissues heal.

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The Swedish Veterinary Medical Association in Stockholm celebrated its seventy-fifth anniversary October 6, 1935. Prof. Gerh. Forssell presided at the meeting. Guests from many foreign countries were present.

HUDSON VALLEY MEETING

The annual meeting of the Hudson Valley Veterinary Medical Society was held at Poughkeepsie, N. Y., November 13, 1935.

Dr. C. E. DeCamp of Scarsdale delivered an interesting paper entitled, "A Consideration of Urinary Calculi in Animals." This paper dealt with the subject quite specifically. The author pointed out that while the exact cause of calculi is unknown, infection is often an important complication. Removal of such infection is very important. Faulty metabolism may be a contributing factor. The use of a ketogenic diet properly modified may be helpful. An adequate supply of vitamins A and D are necessary in the relief and prevention of this formation. He stated that vitamin A should be of animal origin.

After considerable discussion on this and other case reports, the meeting adjourned to meet in Albany on February 12, 1936.

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The Charleston Gazette contained a biographical sketch of Dr. S. E. Hershey on his birthday (February 2nd). Doctor Hershey has practiced in Charleston, West Virginia, 35 years and rates one of the city's most useful citizens. He has been president of the West Virginia Medical Association 15 years, and prior to that, was secretary-treasurer of the association for 16 years.

* * * *

E. B. McClure, age 55, Davenport, Iowa, died of pneumonia, in a Davenport hospital, February 12, 1936. Doctor McClure was born in Harrisonville, Ohio, August 24, 1880, and was graduated from the McKillip Veterinary College. He is survived by his widow, two sons, two daughters, a sister and two brothers.

* * * *

Rubber growers advocate many uses of rubber on farms, from rubber stalls and floorings in cow sheds to rubber rims that make churns less noisy.—*S. N. L.*, 27:736.

* * * *

Mass production was a familiar idea to Roman industry 2,000 years ago.—*S. N. L.*, 28:762.

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C. R. Collins of the firm of Drs. Oberg and Collins, Osceola, Nebraska, has purchased the interest of his partner and will continue the practice alone until his brother graduates from the Iowa State College next June when he will join the practice as junior partner.

Dr. G. A. Roberts, formerly veterinarian of the Agricultural Experiment Station of the Virgin Islands, has accepted the position of Chief Veterinarian and Animal Husbandman of the Dominican Republic (Santo Domingo). His new address is care of the Secretaria de Agricultura, Ciudad Trujillo, Republica Dominicana.

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